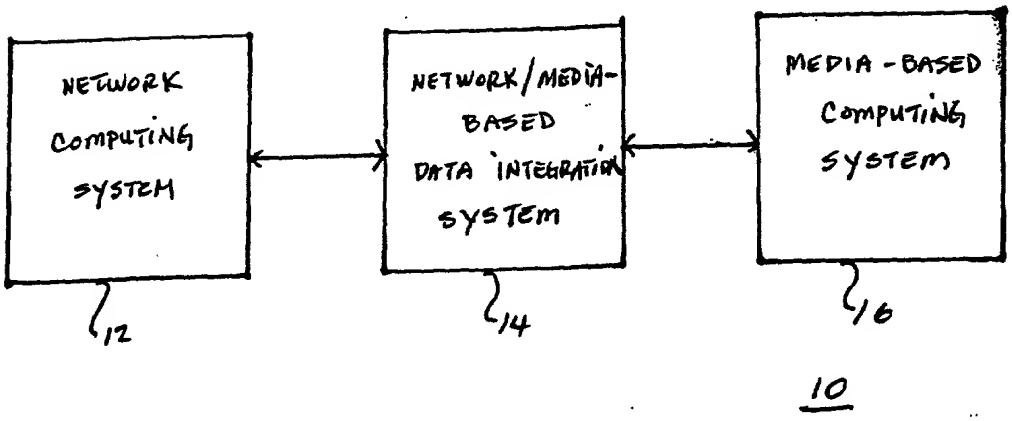

NETWORK COMPUTING SYSTEM
NETWORK/MEDIA-BASED DATA INTEGRATION SYSTEM
MEDIA-BASED COMPUTING SYSTEM
12
14
16
10

FIG. 1A

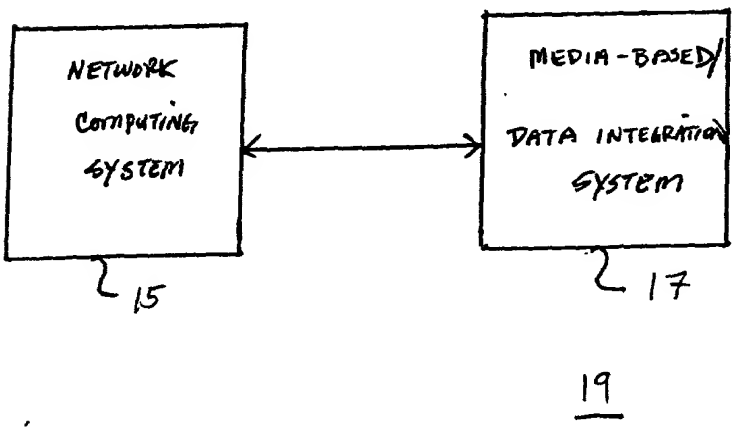

NETWORK COMPUTING SYSTEM
MEDIA-BASED DATA INTEGRATION SYSTEM
15
17
19

FIG. 1B

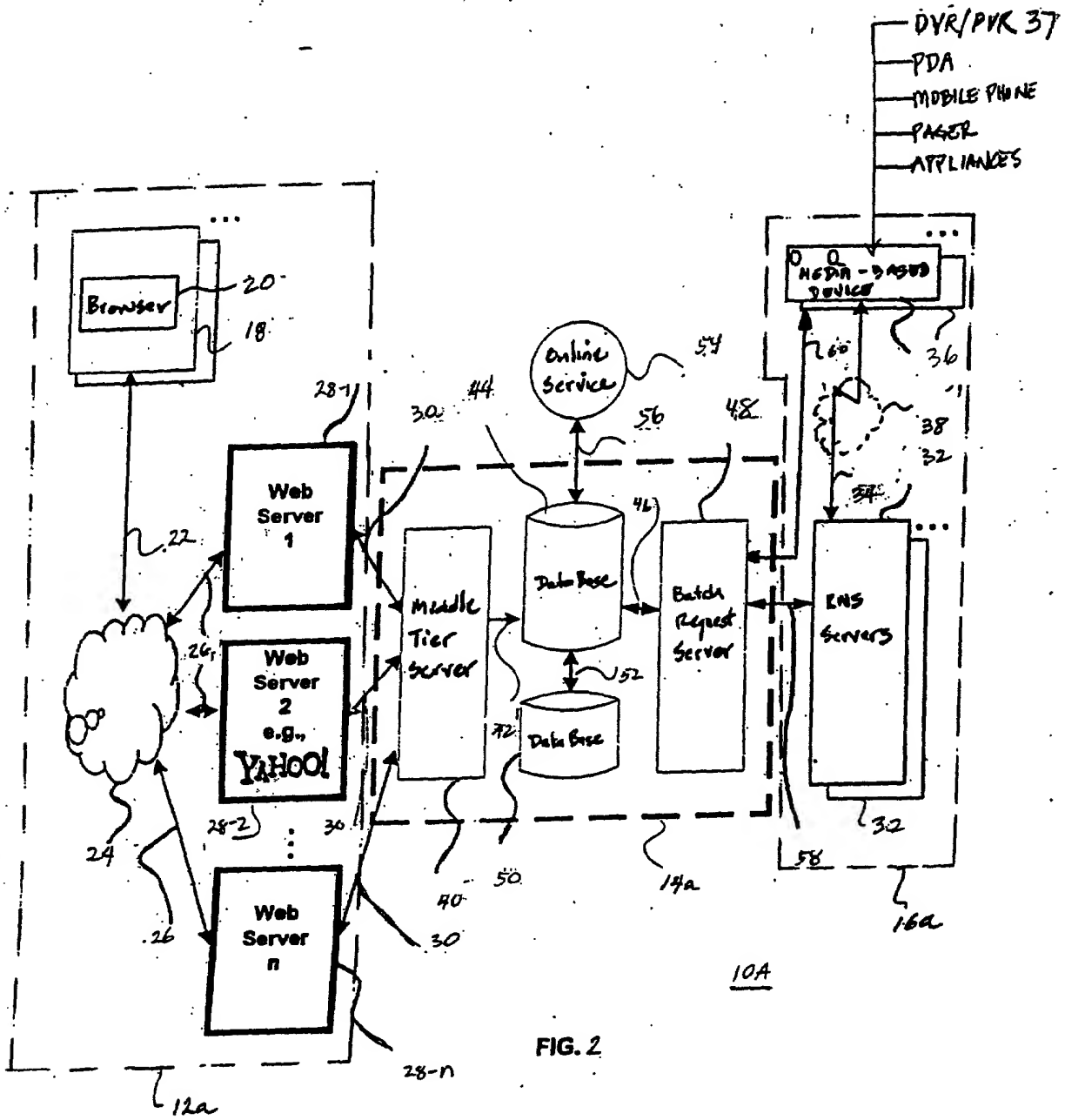

DVR/PVR 37
PDA
MOBILE PHONE
PAGER
APPLIANCES
Browser
20
18
Web Server 1
Web Server 2 e.g., YAHOO!
Web Server n
Middle Tier Server
Data Base
Data Base
Online Service
Batch Request Server
EMS Servers
22
24
26
28-1
28-2
28-n
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
10A
12a
14a
16a

FIG. 2

18/28/40/32/48/36

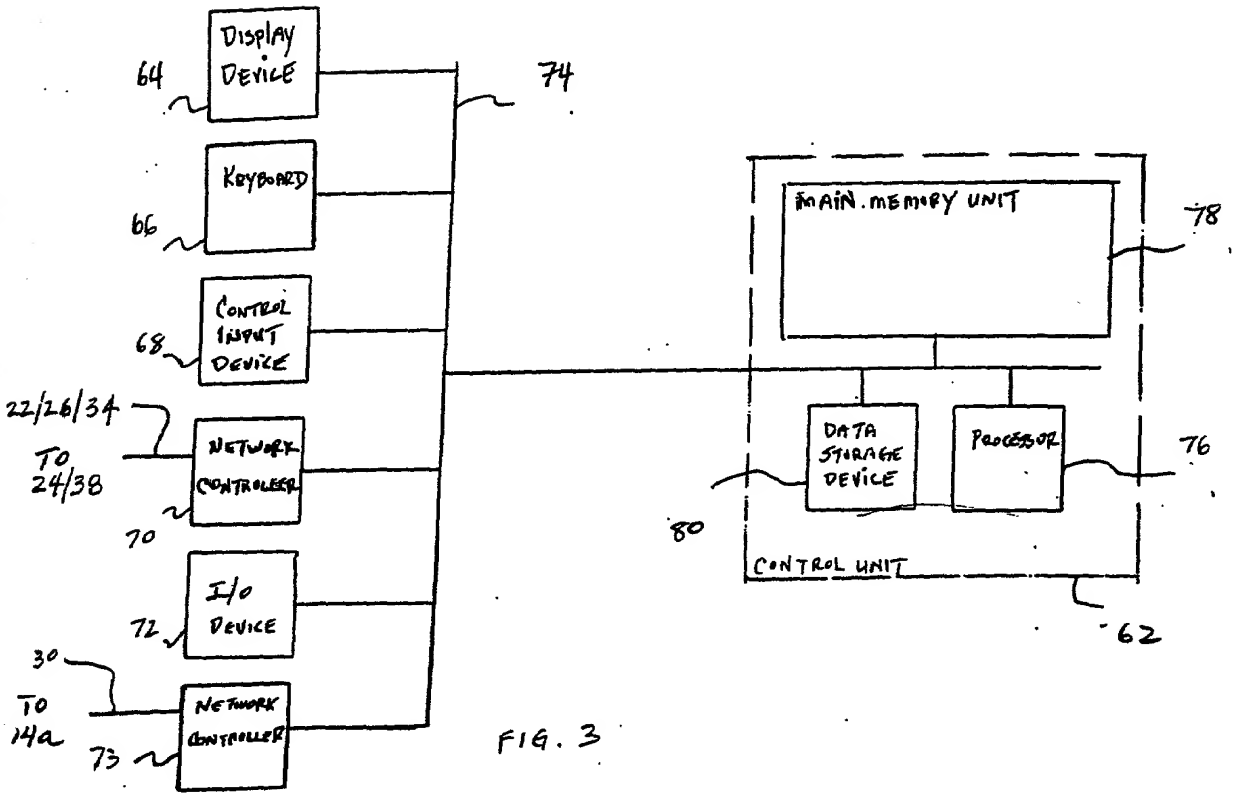


FIG. 3

Express Mail Label No. EV 339 925 963 US

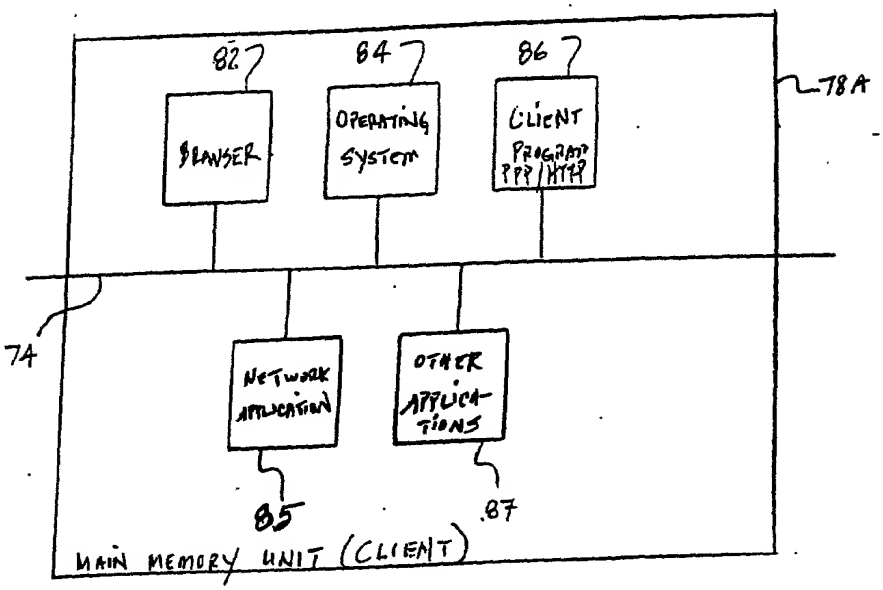

82
84
86
78A
BROWSER
OPERATING SYSTEM
CLIENT PROGRAMS PPP/HTTP
74
NETWORK APPLICATION
OTHER APPLICATIONS
85
87
MAIN MEMORY UNIT (CLIENT)

FIG. 4A

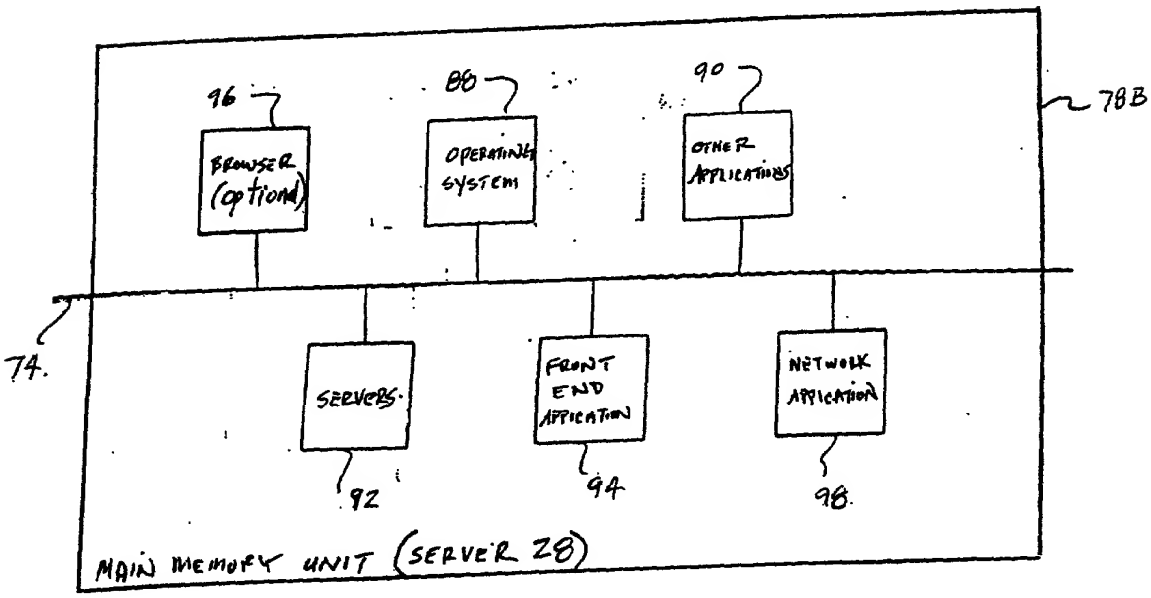

96
88
90
78B
BROWSER (optional)
OPERATING SYSTEM
OTHER APPLICATIONS
74.
SERVERS
FRONT END APPLICATION
NETWORK APPLICATION
92
94
98
MAIN MEMORY UNIT (SERVER 28)

FIG. 4B

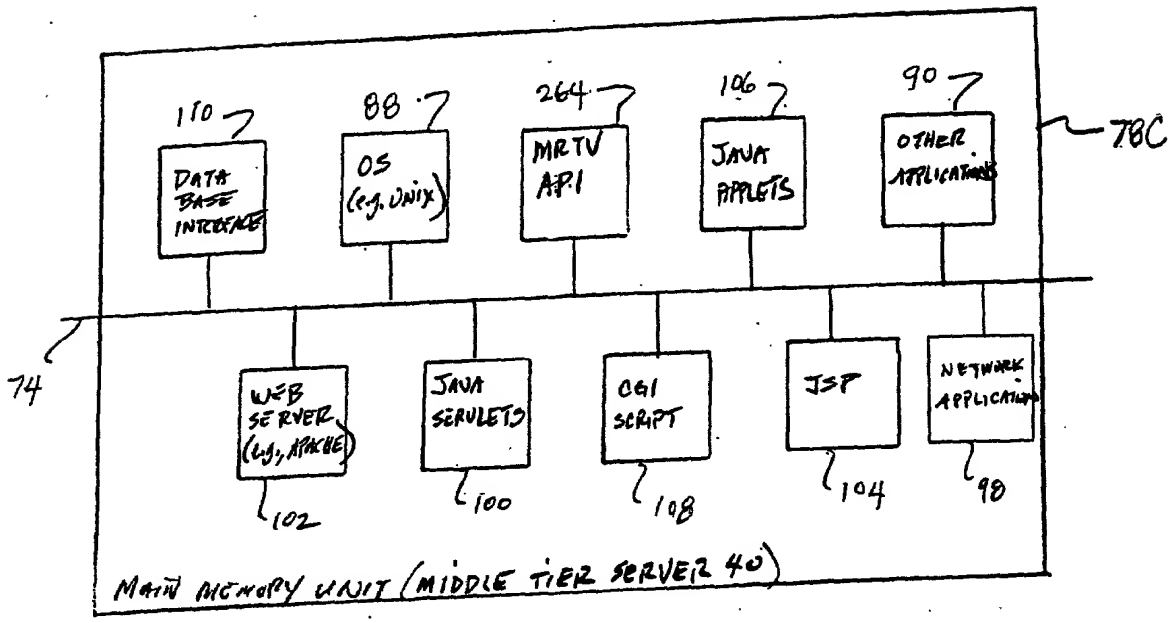

110
DATA BASE INTERFACE
88
OS (e.g. UNIX)
264
MRTV API
106
JAVA APPLETS
90
OTHER APPLICATIONS
78C
74
WEB SERVER (e.g. APACHE)
102
JAVA SERVLETS
100
CGI SCRIPT
108
JSP
104
NETWORK APPLICATION
98
MAIN MEMORY UNIT (MIDDLE TIER SERVER 40)

FIG. 4C

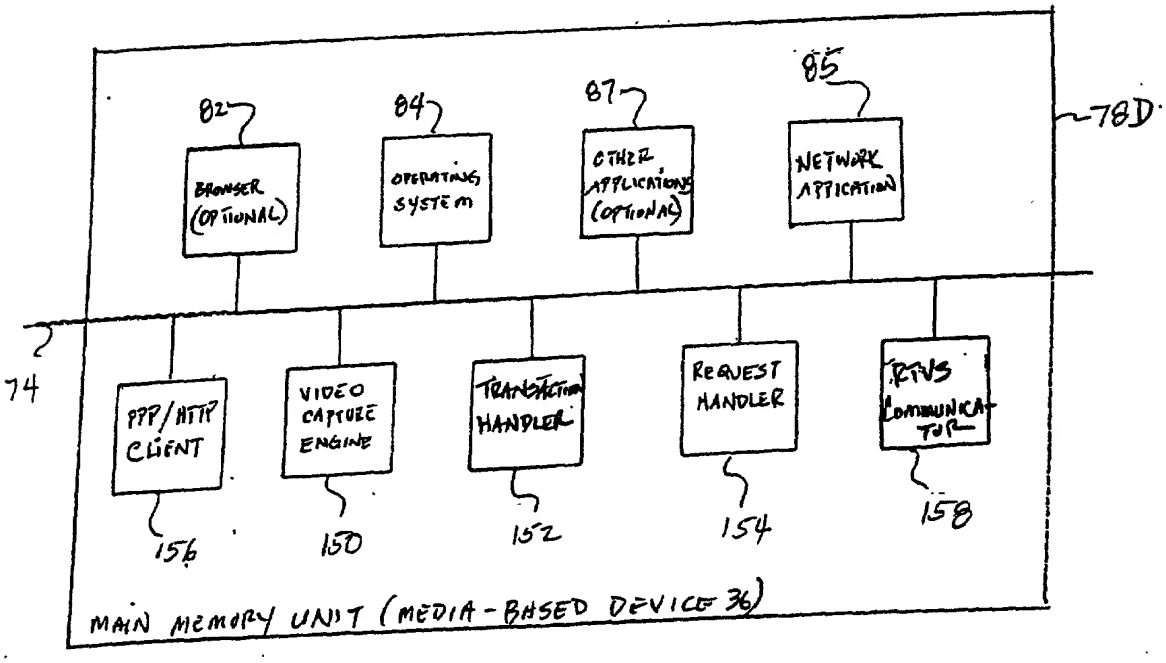

82
BROWSER (OPTIONAL)
84
OPERATING SYSTEM
87
OTHER APPLICATIONS (OPTIONAL)
85
NETWORK APPLICATION
78D
74
PPP/HTTP CLIENT
156
VIDEO CAPTURE ENGINE
150
TRANSACTION HANDLER
152
REQUEST HANDLER
154
RTVS COMMUNICATOR
158
MAIN MEMORY UNIT (MEDIA-BASED DEVICE 36)

FIG. 4D

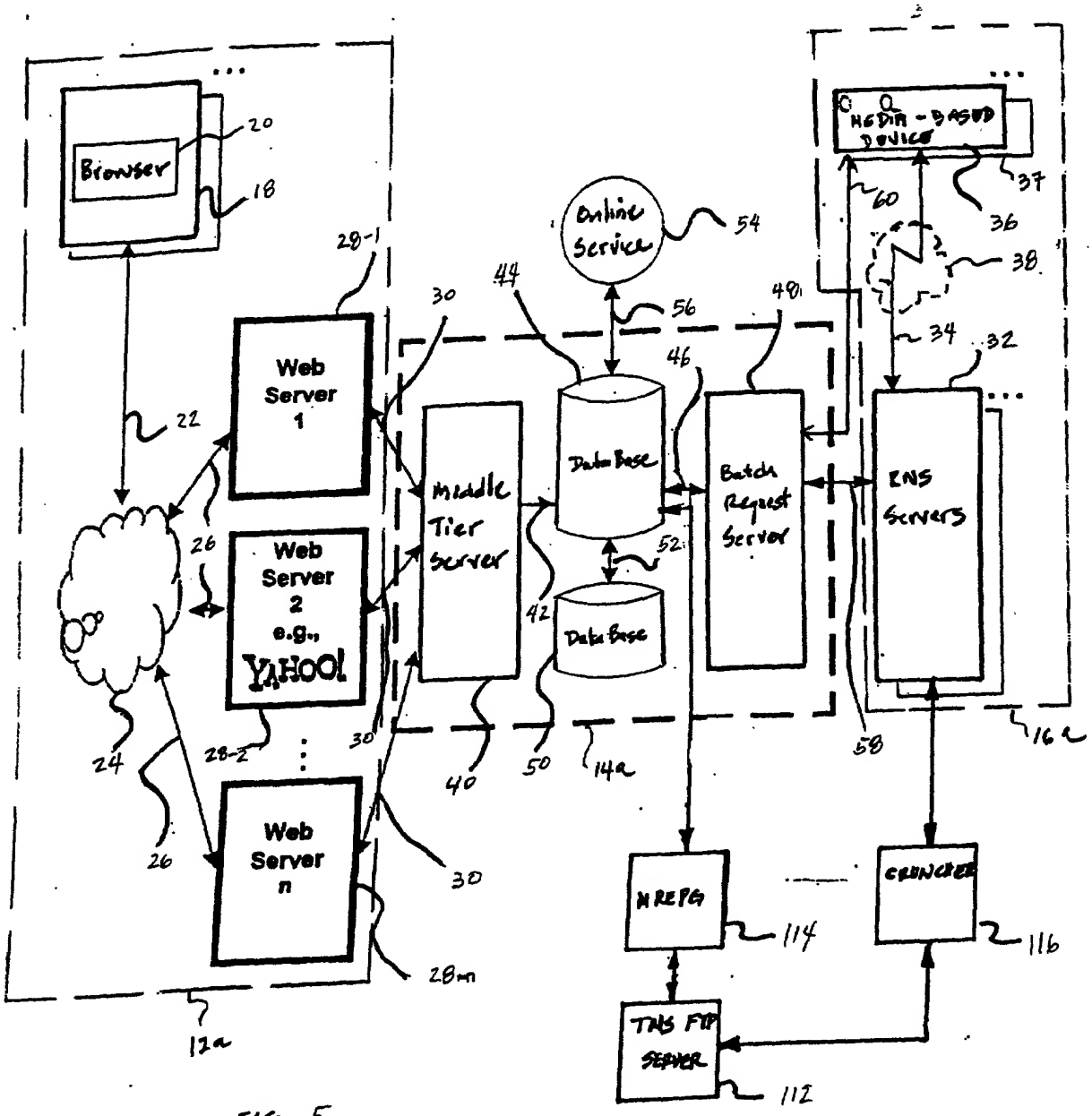

Browser
20
18
Web Server 1
Web Server 2 e.g., YAHOO!
Web Server n
22
24
26
28-1
28-2
28-n
30
Middle Tier Server
40
42
44
Online Service
54
56
Data Base
Data Base
52
46
48
Batch Request Server
50
14a
12a
HDTV-BASED DEVICE
37
60
36
38
34
32
ENS Servers
58
16a
HREPG
114
CRUNCHER
116
TNS FTP SERVER
112
10B

FIG. 5

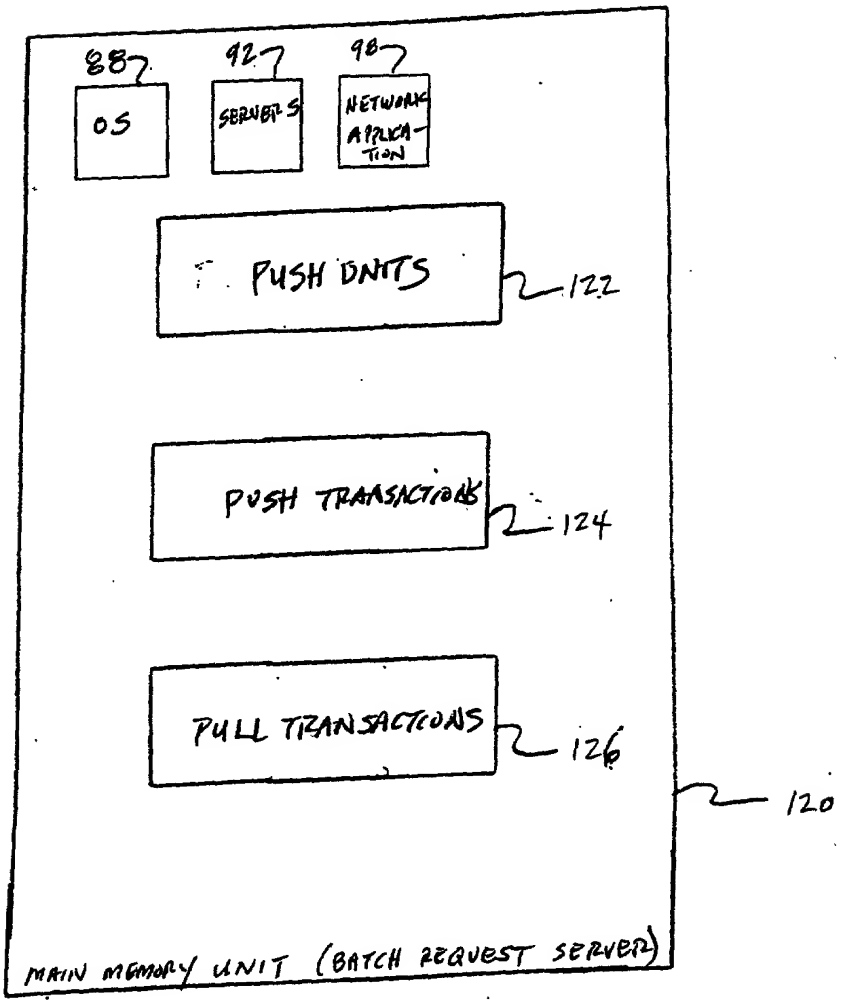

88
OS
92
SERVERS
98
NETWORK APPLICATION
PUSH UNITS
122
PUSH TRANSACTIONS
124
PULL TRANSACTIONS
126
120
MAIN MEMORY UNIT (BATCH REQUEST SERVER)

FIG. 6

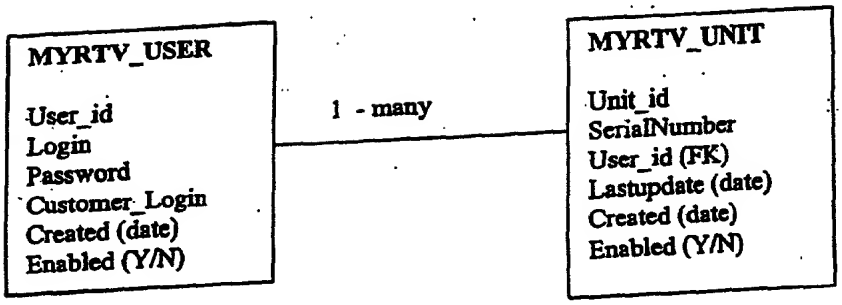

MYRTV_USER
User_id
Login
Password
Customer_Login
Created (date)
Enabled (Y/N)
1 - many
MYRTV_UNIT
Unit_id
SerialNumber
User_id (FK)
Lastupdate (date)
Created (date)
Enabled (Y/N)

FIG. 7

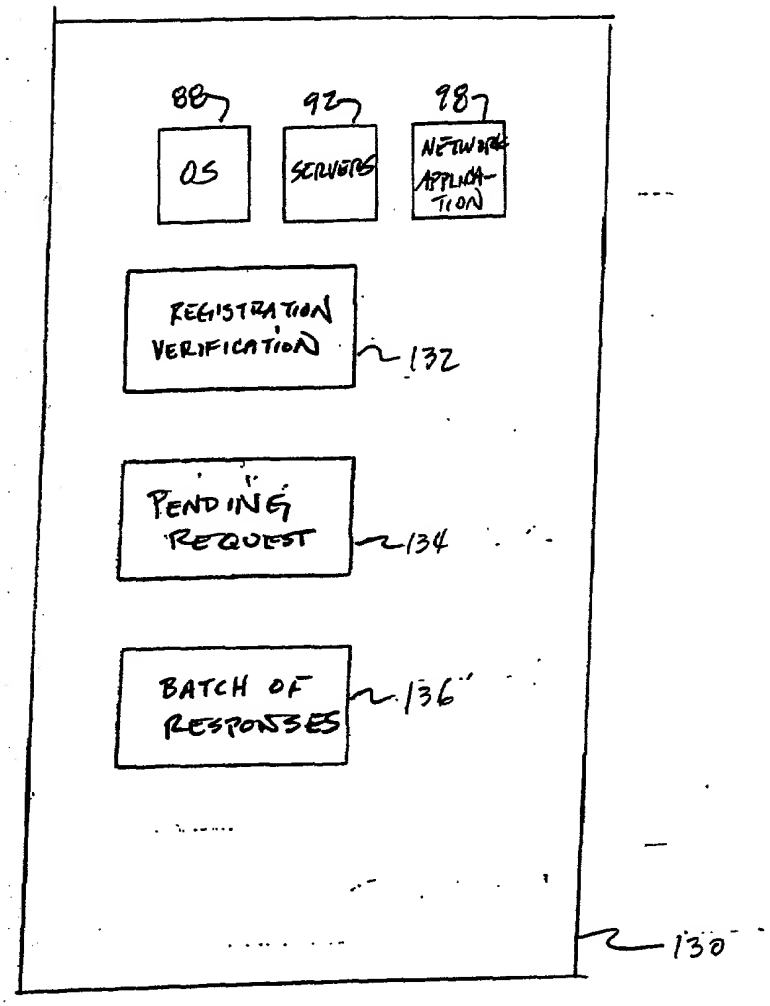

88
92
98
OS
SERVERS
NETWORK APPLICATION
REGISTRATION VERIFICATION
132
PENDING REQUEST
134
BATCH OF RESPONSES
136
130

FIG. 8

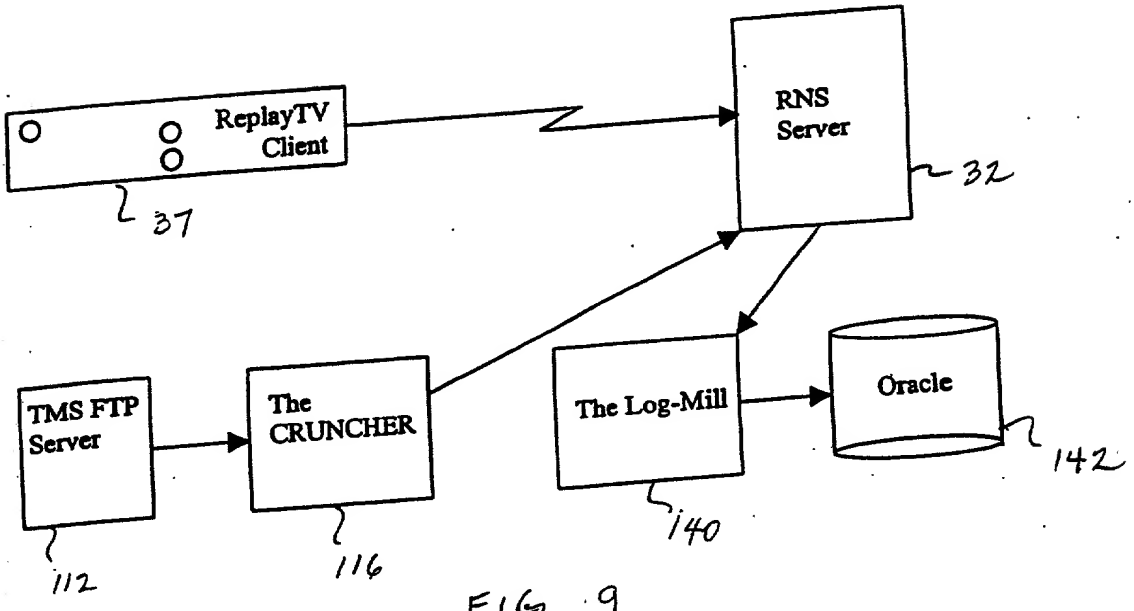

ReplayTV
Client
37
RNS
Server
32
TMS FTP
Server
112
The
CRUNCHER
116
The Log-Mill
140
Oracle
142

FIG. 9

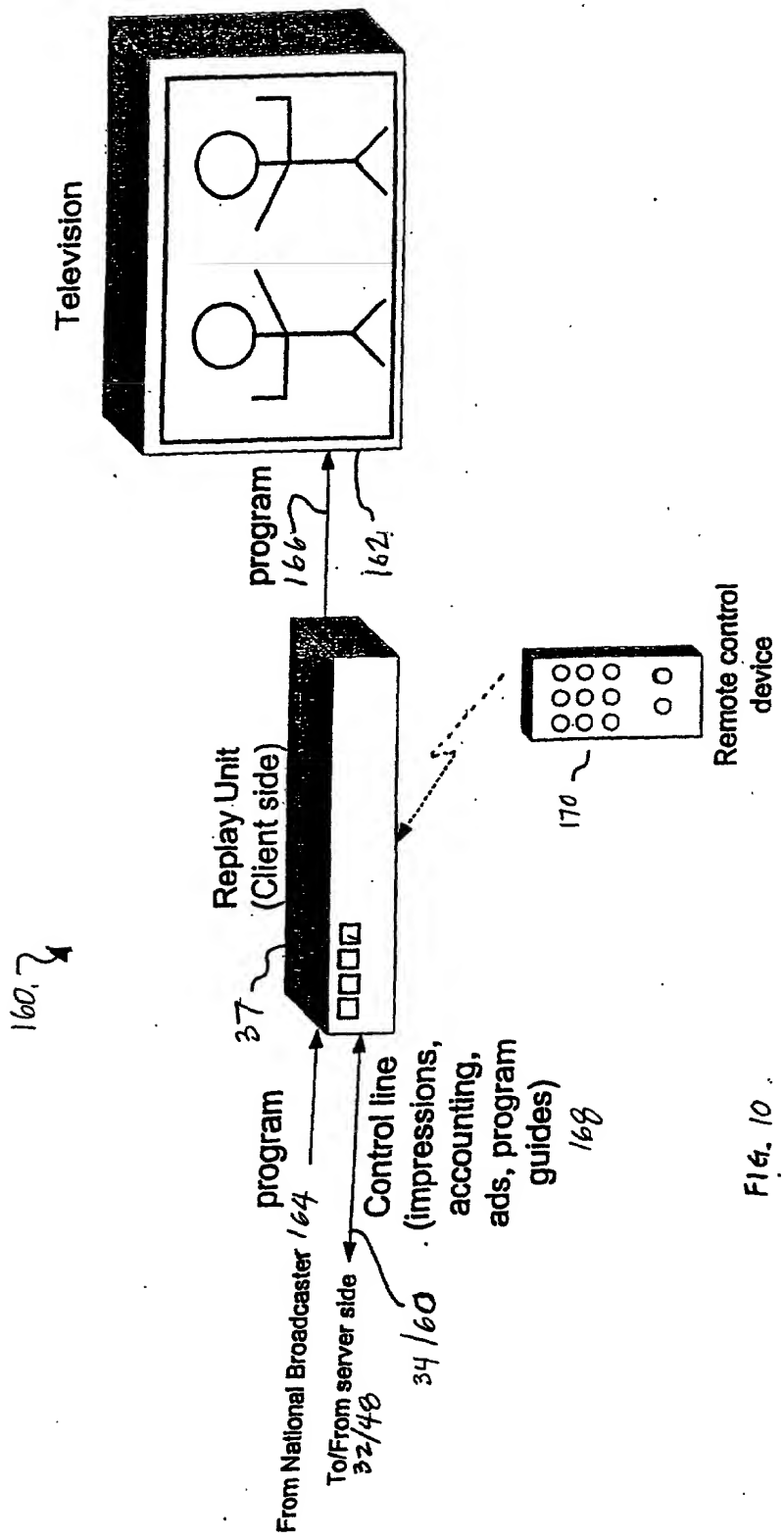

Television
program
166
162
Replay Unit
(Client side)
37
160
Remote control
device
170
program
164
Control line
(impressions,
accounting,
ads, program
guides)
168
From National Broadcaster
To/From server side
32/48
34/160

FIG. 10

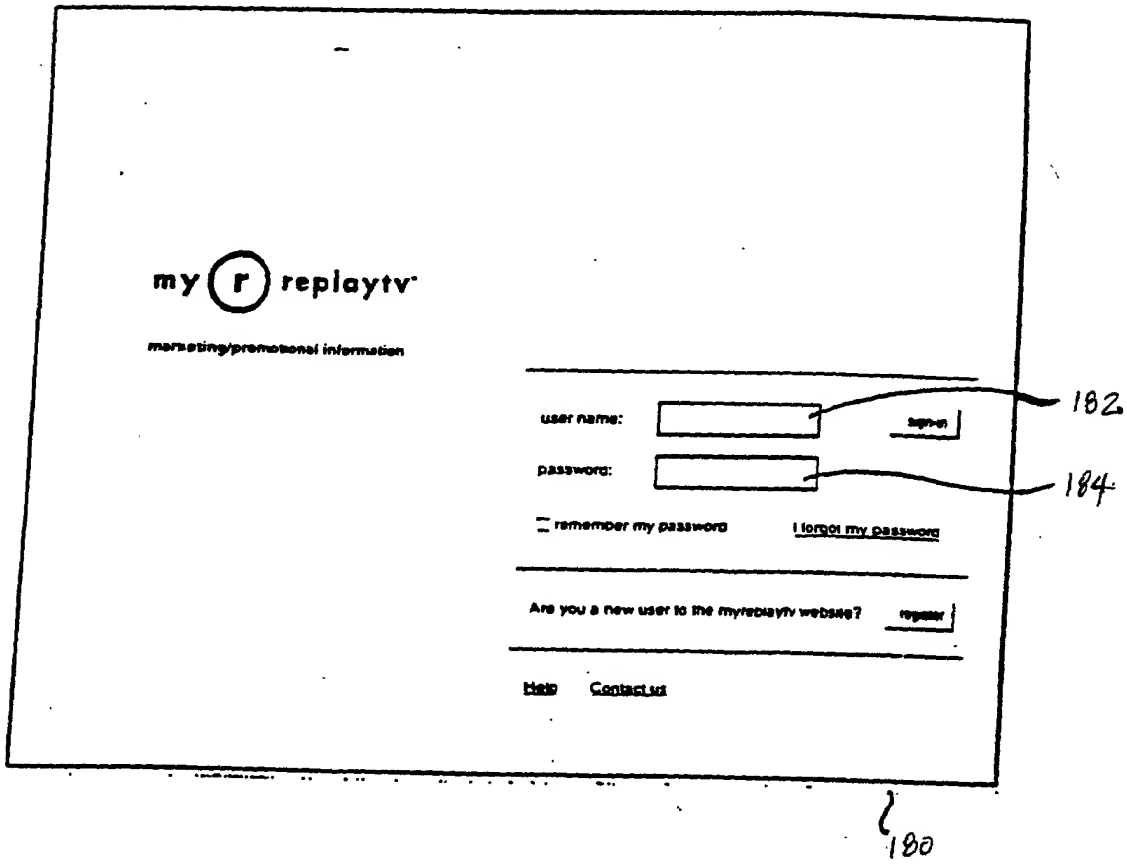


FIG. 11

05390-05390

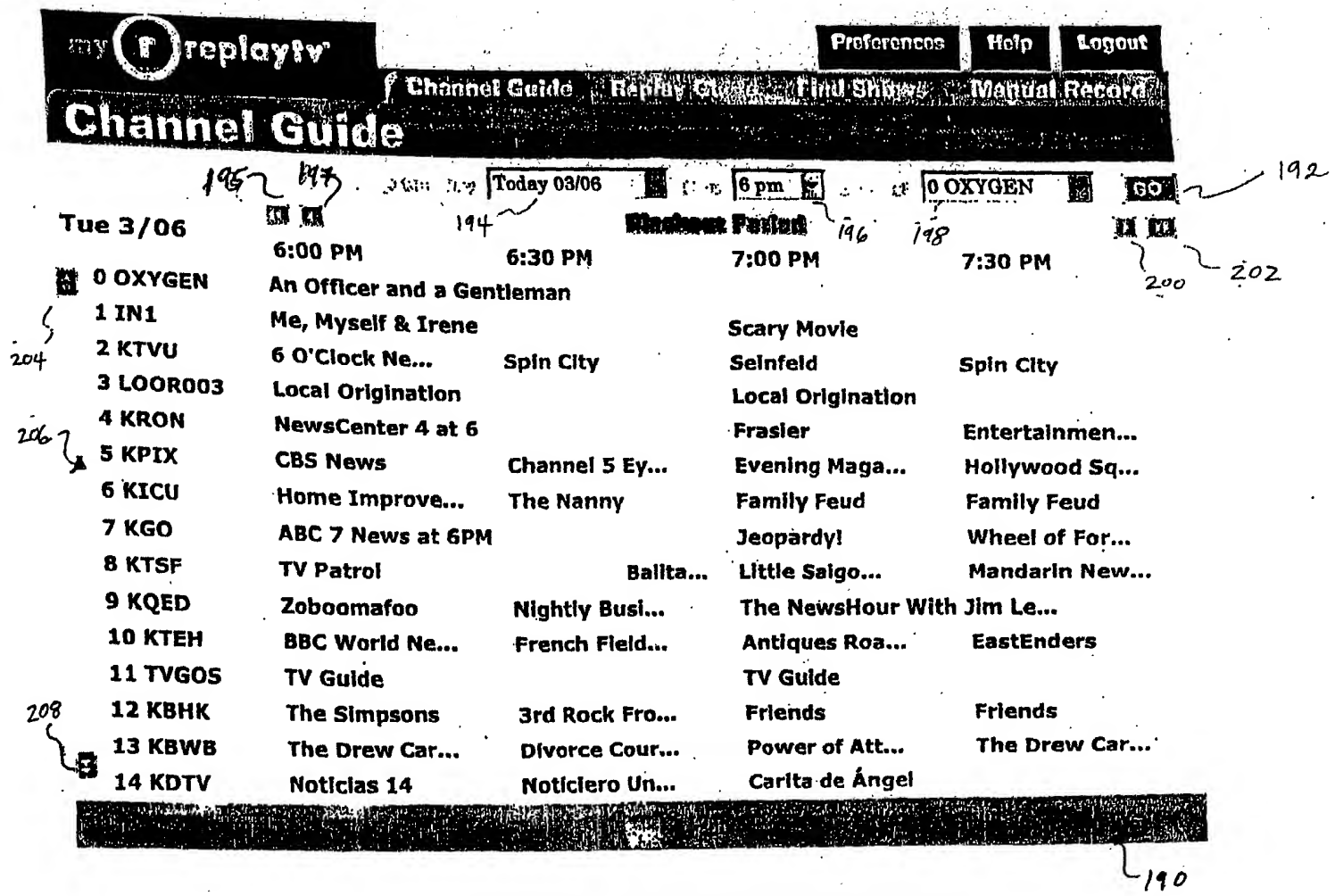


FIG. 12A

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US

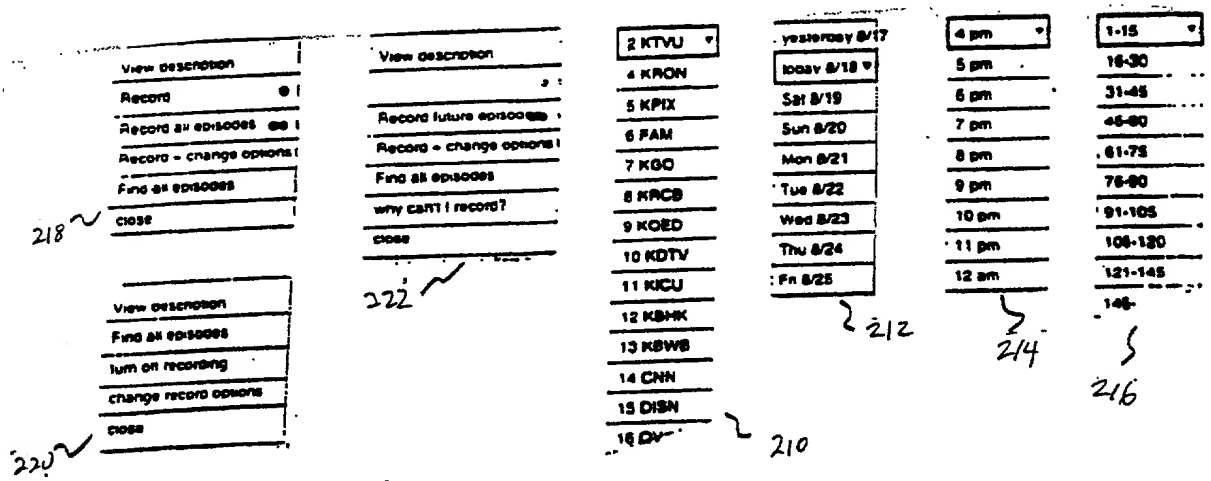

View description
Record
Record all episodes
Record - change options
Find all episodes
close
218
View description
Record future episodes
Record - change options
Find all episodes
why can't I record?
close
222
View description
Find all episodes
Turn on recording
change record options
close
220
2 KTVU
4 KRON
5 KPIX
6 FAM
7 KGO
8 KRCB
9 KQED
10 KDTV
11 KICU
12 KBHK
13 KBWB
14 CNN
15 DISN
16 DY
210
yesterday 8/17
today 8/18
Sat 8/19
Sun 8/20
Mon 8/21
Tue 8/22
Wed 8/23
Thu 8/24
Fri 8/25
212
4 pm
5 pm
6 pm
7 pm
8 pm
9 pm
10 pm
11 pm
12 am
214
1-15
16-30
31-45
46-60
61-75
76-90
91-105
106-120
121-145
146-
216

FIG. 12B

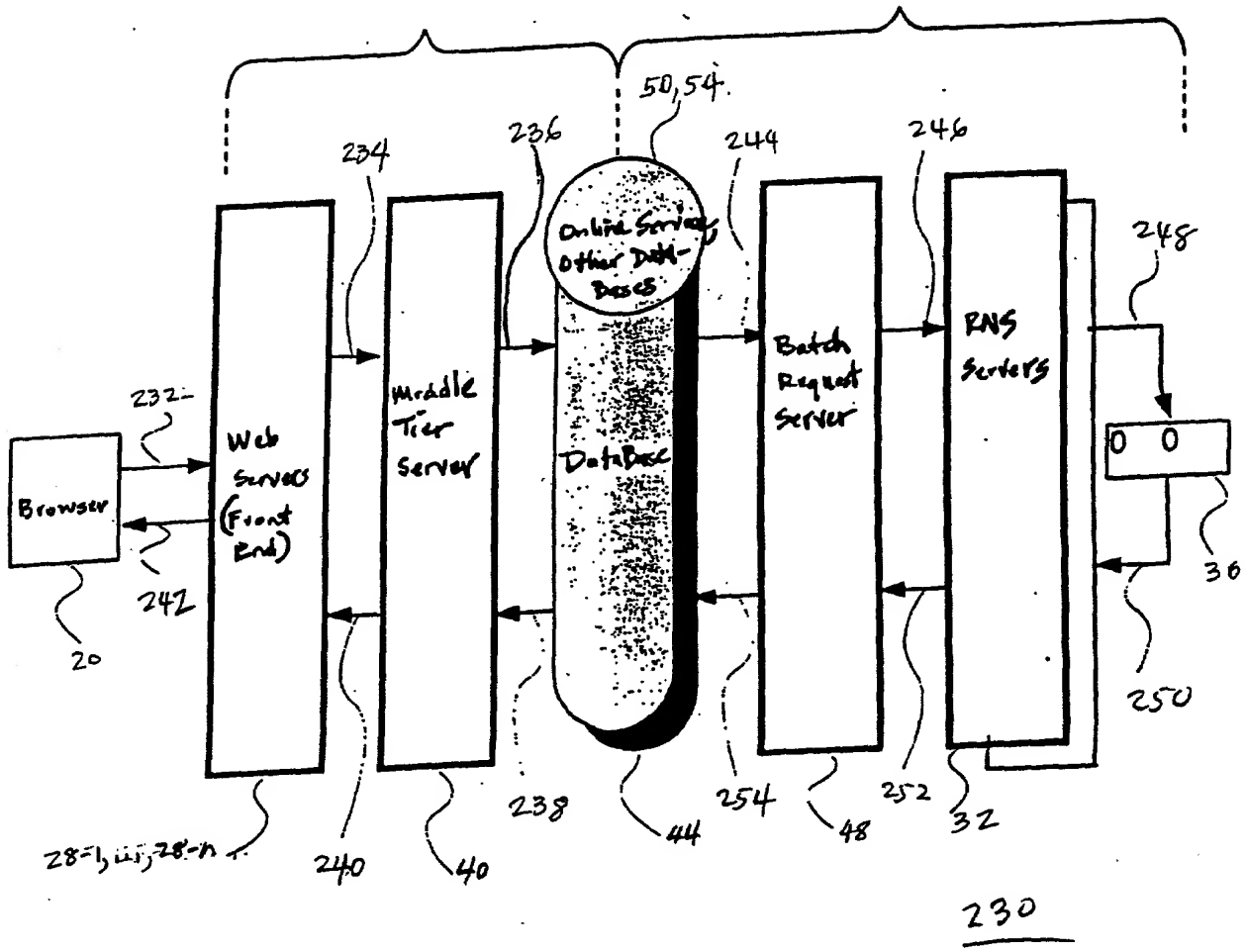

50,54
234
236
244
246
248
Online Services, Other Data-Bases
Middle Tier Server
Batch Request Server
RNS Servers
232
Browser
Web Servers (Front End)
DataBase
242
20
30
250
238
254
252
44
48
32
240
40
230

FIG. 13A

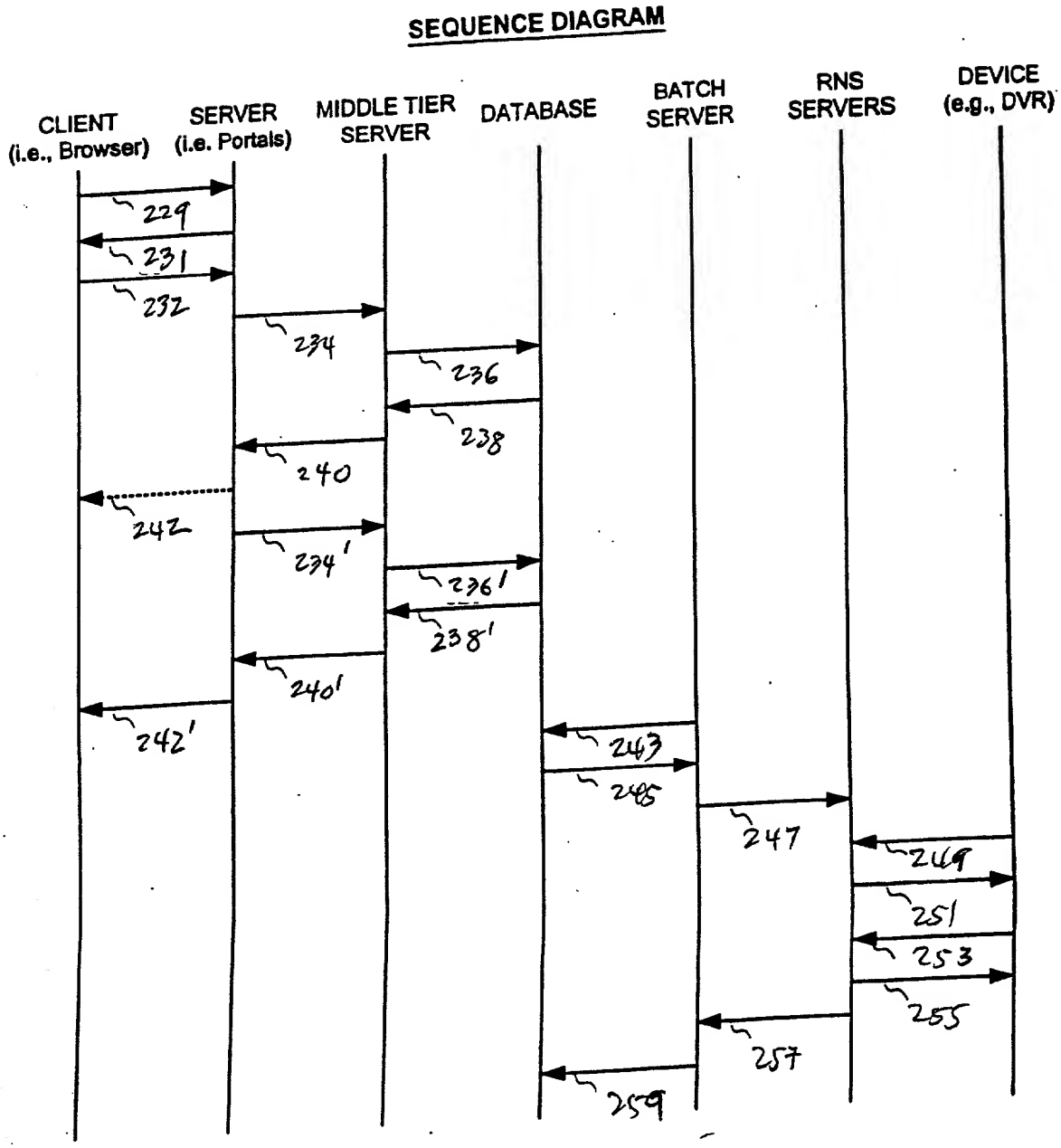

SEQUENCE DIAGRAM
CLIENT (i.e., Browser)
SERVER (i.e. Portals)
MIDDLE TIER SERVER
DATABASE
BATCH SERVER
RNS SERVERS
DEVICE (e.g., DVR)
229
231
232
234
236
238
240
242
234'
236'
238'
240'
242'
243
245
247
249
251
253
255
257
259

FIG. 13B

API Routine	Function
CreateAccount	Creates an account for a new user based on the information received
Login	Tries to authenticate a user based on the input username and password combination
GetProfile	Returns the profile of the user and his units based on his userid
AddRequest	Adds a request to the unit's list of pending requests based on a set of request parameters, and returns the full status of the unit and of the pending requests, including those for recording specified show(s) and deleting recorded show(s)
DeleteRequest	Delete a request from the user list of pending requests
GetReplayGuide	Returns the Replay Guide of the unit as saved in the appropriate database for the specified unit
GetChannelLineUp	Returns the channel lineup of the unit based on the unit's settings
ChangePassword	Lets the user changes his password
GetEPG	Returns the current electronic program guide for the unit based on the settings of the unit
ShowGuide	Returns detailed information about a specified show or search show details for particular shows based on criteria given as parameters

FIG. 14

Express Mail Label No. EV 339 925 259 US

T08030 "02T52660

API Routine	Input Parameters	Output Files (Corresponding XML elements)
CreateAccount	firstname, lastname, address1, address2, city, state, zipcode, serialnumber, login, password, creator	ACCOUNT.XML REPLAYERROR.XML
Login	login, password	ACCOUNT.XML REPLAYERROR.XML
GetProfile	userid	PROFILE.XML (USERINFO, UNITINFO-I) REPLAYERROR.XML
AddRequest	userid, unitid, reqtype(none, show, theme, update) reqtype=show: showtype(single, repeat, manual single, manual repeat), headendid, tmsid, device, starttimegmt, name, durationinminutes, inputsource, quality, guaranteedrecord, numepisodes, weekdayflags, earlystartminutes, showguarminutes reqtype=theme: searchterm, searchflags, suzukid, durationinminutes, quality, guaranteedrecord reqtype=update: updatetype(deleteshow, preserveshow, deletechannel), channelid, showid	UNITSTATUS.XML (UNITINFO, REQUESTSTATUS-I) REPLAYERROR.XML *Note: REQUESTSTATUS Result:=(PENDING, SENT, SUCCESS, GENERAL FAILURE, SCHEDULEFAILURE, ROOMFAILURE)
DeleteRequest	userid, unitid, requestid	DELETERESULT.XML REPLAYERROR.XML
GetReplayGuide	userid, unitid	GUIDE.XML (REPLAYCHANNEL-I) REPLAYERROR.XML *Note: REPLAYCHANNEL Type:=(SINGLE, SINGELMANUAL, REPEAT, REPEATMANUAL, THEME, THEMEEXACT, ZONE)
GetChannelLineUp	userid, unitid	CHANNELLINEUP.XML (CHANNEL-I) REPLAYERROR.XML
ChangePassword	userid, currentpassword, newpassword	ACCOUNT.XML REPLAYERROR.XML
GetEPG	userid, unitid, starttimegmt, durationinminutes, startchannel, channelcount	XML file based on tvguide.dtd & tvprograms.dtd REPLAYERROR.XML
ShowGuide	userid, unitid, query, start, count, levelofdetail *Note: query keywords include actor, advisory, desc, mpaarating, title, etc.	XML file based on tvguide.dtd & tvprograms.dtd REPLAYERROR.XML

FIG. 15

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US

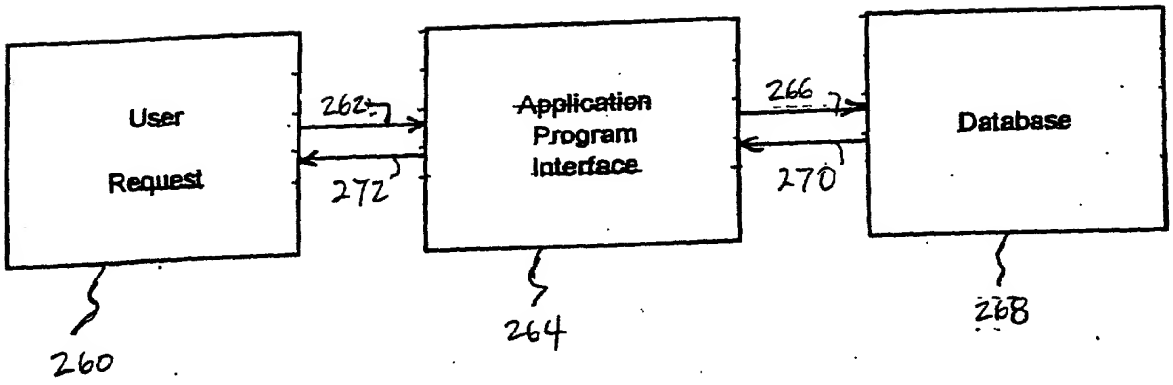

User Request
262
272
Application Program Interface
266
270
Database
260
264
268

FIG. 16A

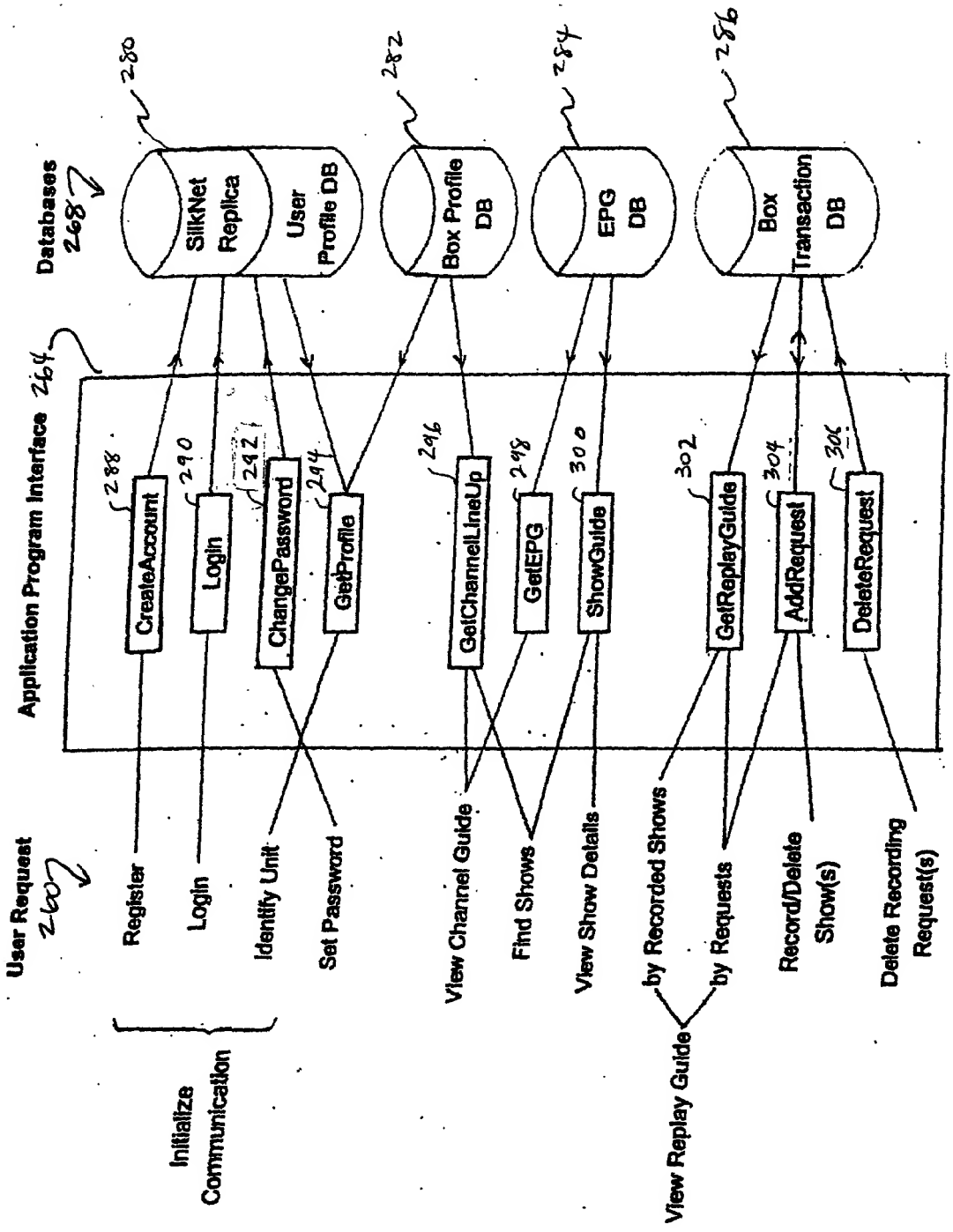

Databases 268
280
SilkNet Replica
User Profile DB
282
Box Profile DB
284
EPG DB
286
Box Transaction DB
Application Program Interface 264
288
CreateAccount
290
Login
242
ChangePassword
294
GetProfile
296
GetChannelLineUp
298
GetEPG
300
ShowGuide
302
GetReplayGuide
304
AddRequest
306
DeleteRequest
User Request 260
Register
Login
Identify Unit
Set Password
View Channel Guide
Find Shows
View Show Details
View Replay Guide by Recorded Shows
by Requests
Record/Delete Show(s)
Delete Recording Request(s)
Initialize Communication

FIG. 16B

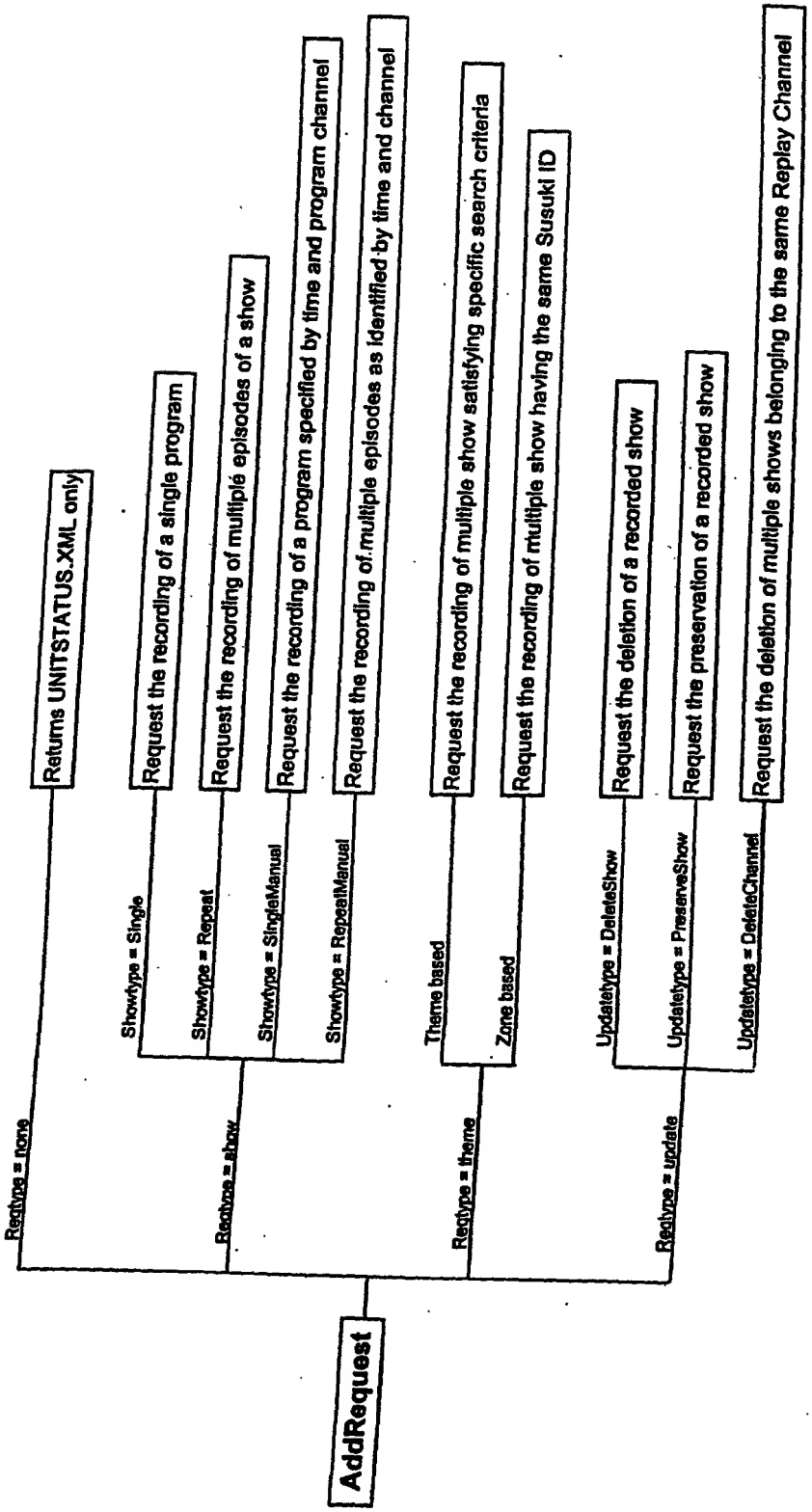

AddRequest
Reqtype = none
Returns UNITSTATUS.XML only
Reqtype = show
Showtype = Single
Request the recording of a single program
Showtype = Repeat
Request the recording of multiple episodes of a show
Showtype = SingleManual
Request the recording of a program specified by time and program channel
Showtype = RepeatManual
Request the recording of multiple episodes as identified by time and channel
Reqtype = theme
Theme based
Request the recording of multiple show satisfying specific search criteria
Zone based
Request the recording of multiple show having the same Susuki ID
Reqtype = update
Updatetype = DeleteShow
Request the deletion of a recorded show
Updatetype = PreserveShow
Request the preservation of a recorded show
Updatetype = DeleteChannel
Request the deletion of multiple shows belonging to the same Replay Channel

FIG. 17

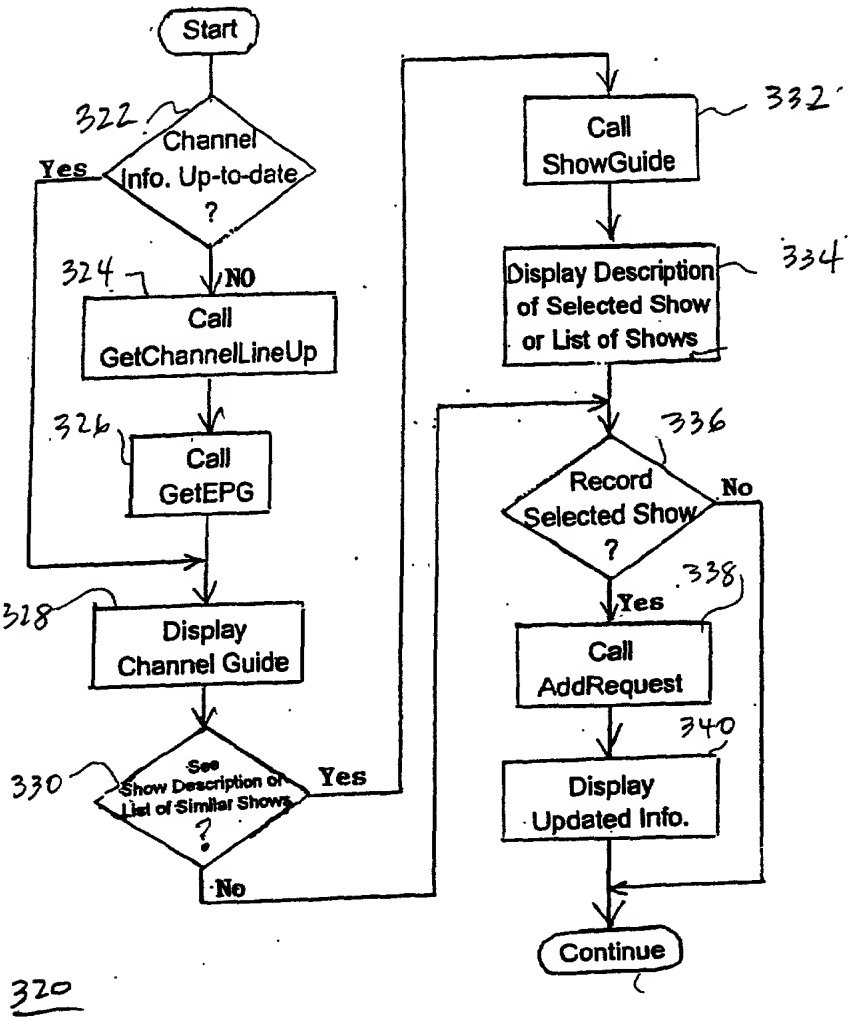
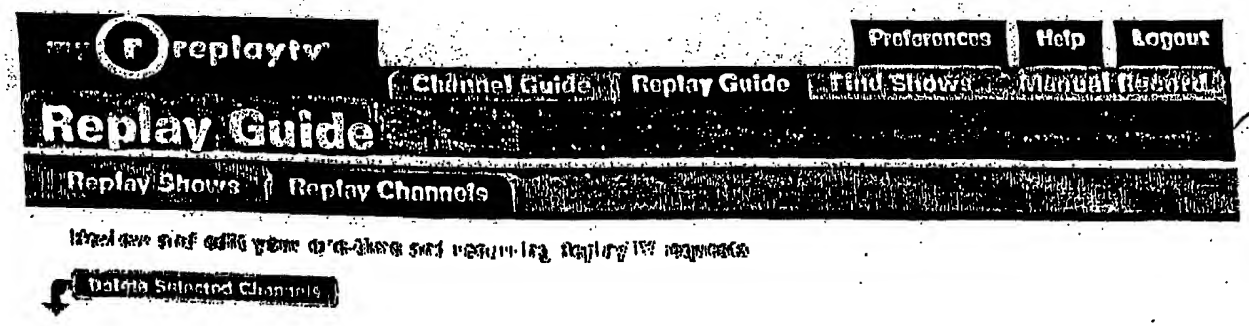

Start
322
Channel Info. Up-to-date ?
Yes
NO
324
Call GetChannelLineUp
326
Call GetEPG
328
Display Channel Guide
330
See Show Description or List of Similar Shows ?
Yes
No
332
Call ShowGuide
334
Display Description of Selected Show or List of Shows
336
Record Selected Show ?
No
Yes
338
Call AddRequest
340
Display Updated Info.
Continue
320

FIG. 18

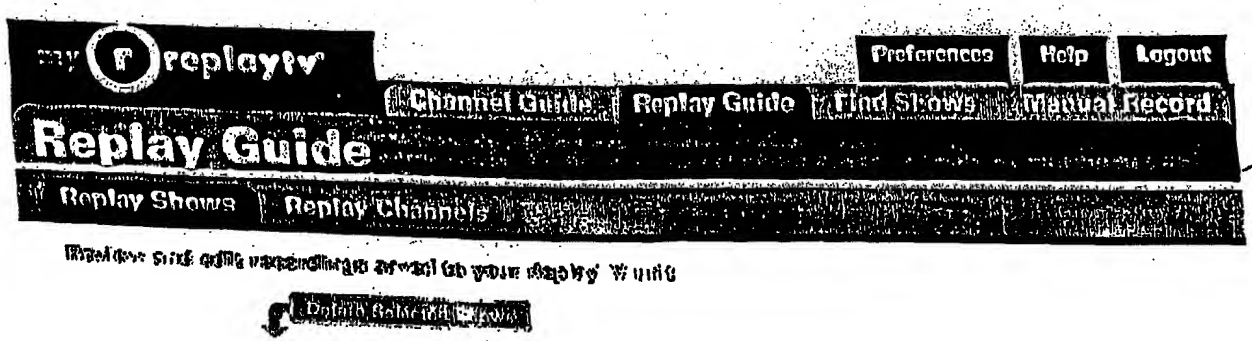


2350

Channel	Details	Status	Request Date
☐ A Fistful of Dollars	This single record Replay channel was scheduled to record A Fistful of Dollars from Channel 21(TBS) on Sun, 02/18 at or around 7:00AM - 9:00AM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		02/18
☐ Blown Away	This single record Replay channel was scheduled to record Blown Away from Channel 42(USAP) on Tue, 01/16 at or around 9:00PM - 11:30PM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		01/16
☐ Cantonese News	This show-based Replay channel will continuously record the 1 most current episode(s) of Cantonese News occurring every (Sun, Mon, Tue, Wed, Thu, Fri, Sat) on Channel 8(KTSF) at or around 8:00PM - 9:00PM. Guaranteed at EXTENDED quality.		02/28
☐ Captain January	This single record Replay channel was scheduled to record Captain January from Channel 49(AMC) on Tue, 01/09 at or around 3:30AM - 5:00AM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		01/09

FIG. 19A

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US



Replay this and other recordings stored on your ReplayTV Unit

Delete Selected Now

Channel	Show Title/Episode	Date/Time	Station	Duration	Size
A Fistful of Dollars	☐ A Fistful of Dollars	02/18 7:00AM	21 TBS	(2h)	6.46%
Blown Away	☐ Blown Away	01/16 9:00PM	42 USAP	(2h 30m)	8.07%
Captain January	☐ Captain January	01/09 3:30AM	49 AMC	(1h 30m)	4.84%
Firewalker	☐ Firewalker	02/27 8:00PM	21 TBS	(2h)	6.46%
On Deadly Ground	☐ On Deadly Ground	01/07 9:00PM	4 KRON	(2h)	6.46%
Platoon	☐ Platoon	02/04 8:00PM	37 TNTP	(2h 30m)	8.07%
The Bridge on the River Kwai	☐ The Bridge on the River Kwai	12/24 8:00AM	42 USAP	(3h 30m)	11.30%
The Little Princess	☐ The Little Princess	12/26 4:15AM	49 AMC	(1h 45m)	5.65%
The Trouble With Harry	☐ The Trouble With Harry	12/18 1:05PM	49 AMC	(1h 55m)	6.19%
Welcome to ReplayTV	☐ Welcome to ReplayTV	09/08 10:49AM		(15m)	2.42%

FIG. 19B

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US

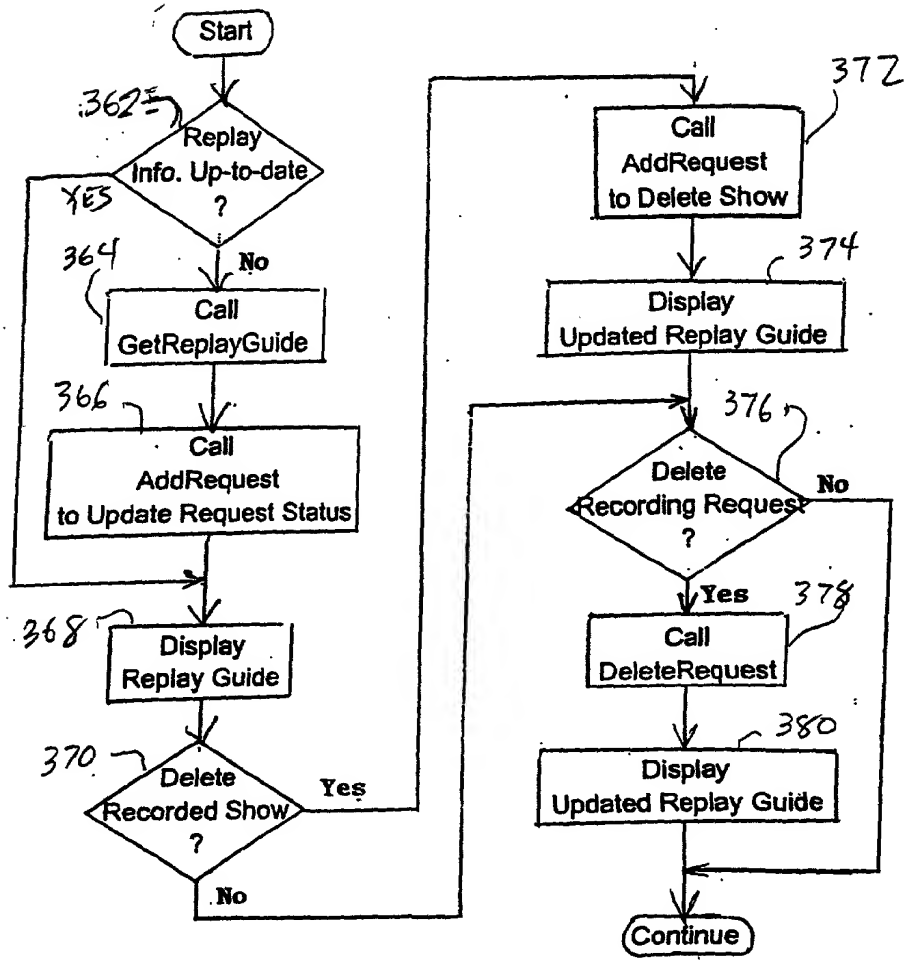

Start
362
Replay Info. Up-to-date ?
YES
No
364
Call GetReplayGuide
366
Call AddRequest to Update Request Status
368
Display Replay Guide
370
Delete Recorded Show ?
Yes
No
372
Call AddRequest to Delete Show
374
Display Updated Replay Guide
376
Delete Recording Request ?
No
Yes
378
Call DeleteRequest
380
Display Updated Replay Guide
Continue
360

FIG. 20

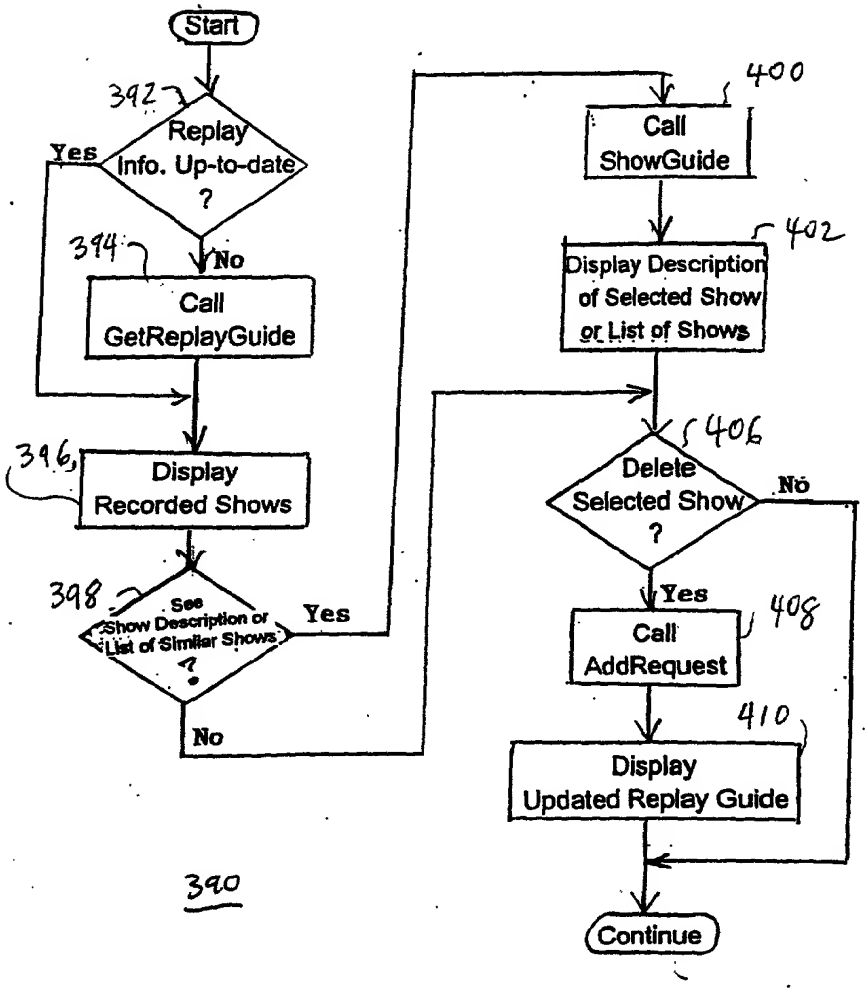


FIG. 2

Express Mail Label No. EV 325 625 925 US

70806D 02T52660

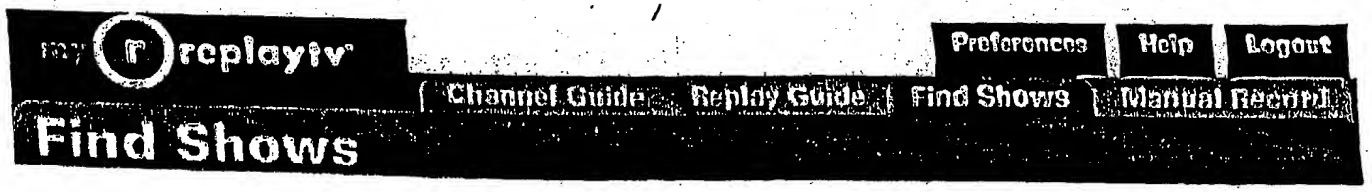


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FIG. 22

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US

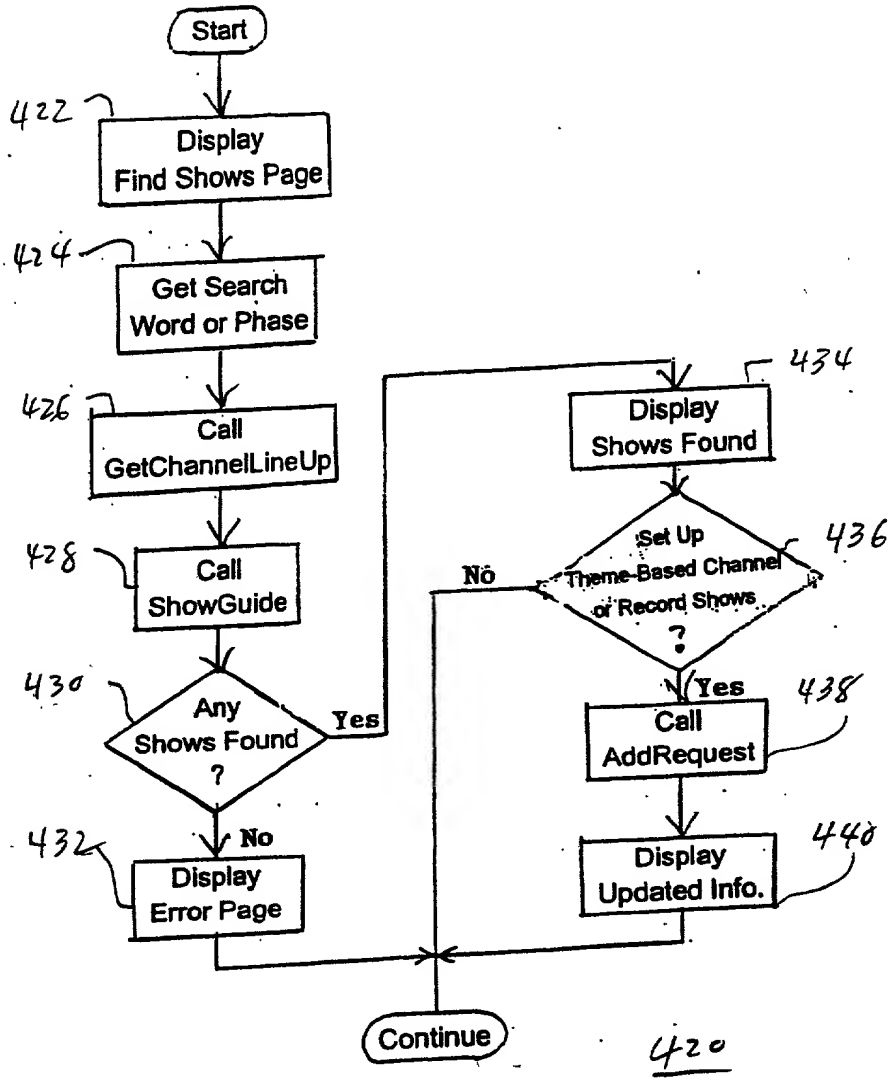
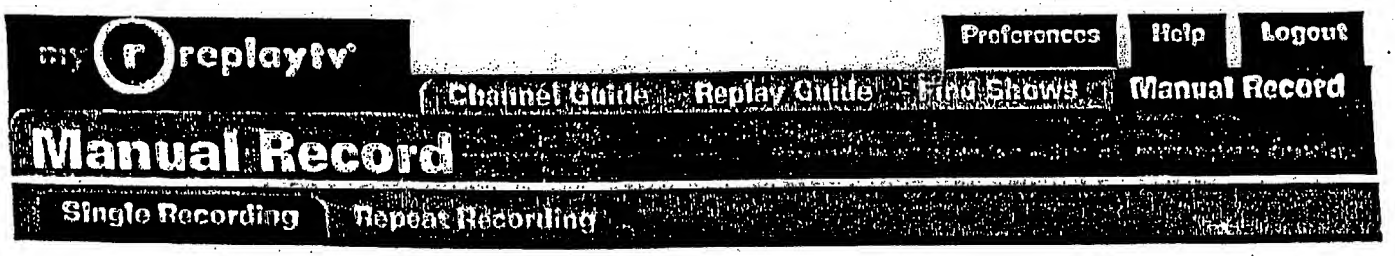

Start
422
Display Find Shows Page
424
Get Search Word or Phase
426
Call GetChannelLineUp
428
Call ShowGuide
430
Any Shows Found ?
Yes
No
432
Display Error Page
434
Display Shows Found
436
Set Up Theme-Based Channel or Record Shows ?
No
Yes
438
Call AddRequest
440
Display Updated Info.
Continue
420

FIG. 23



450

FIG. 24A

Title: Method and System for Remote Television Replay Control
Applicants: Millard E. Sweatt, III, et al.
Docket No.: 22407-05390 US

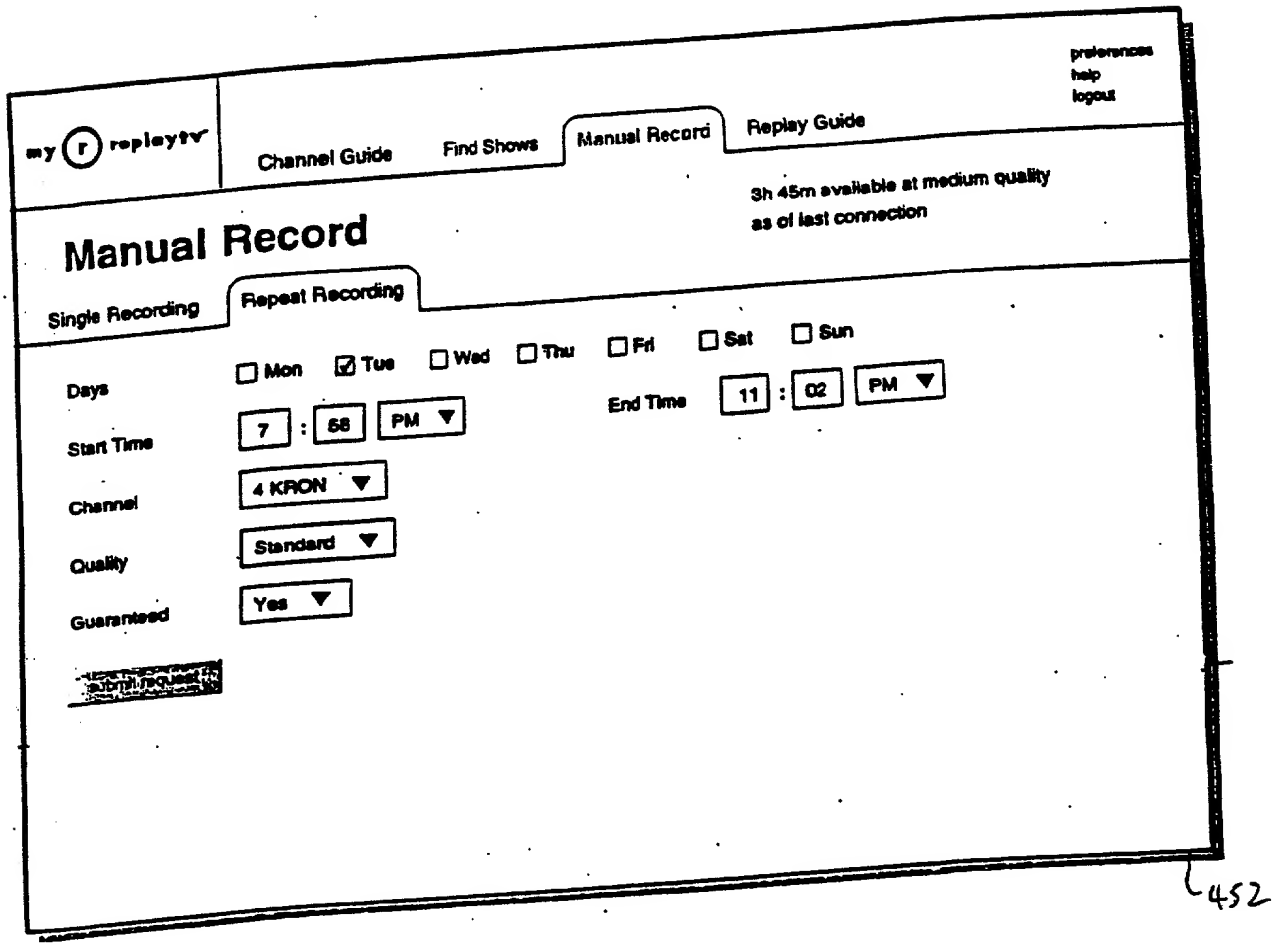


FIG. 24B

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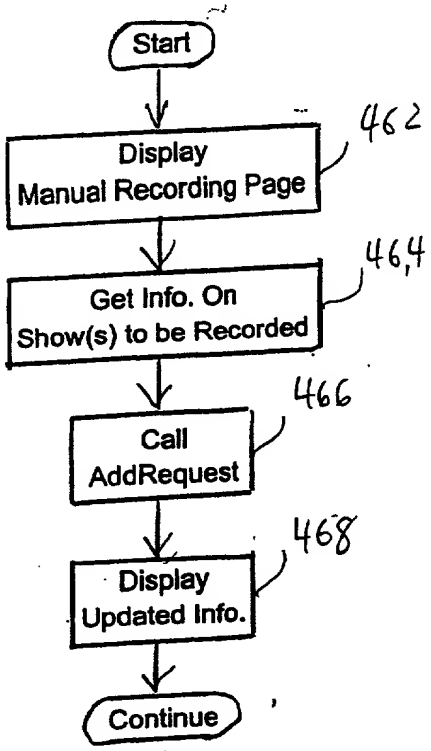

FIG. 25

Express Mail Label No. EV 339 926 525 US

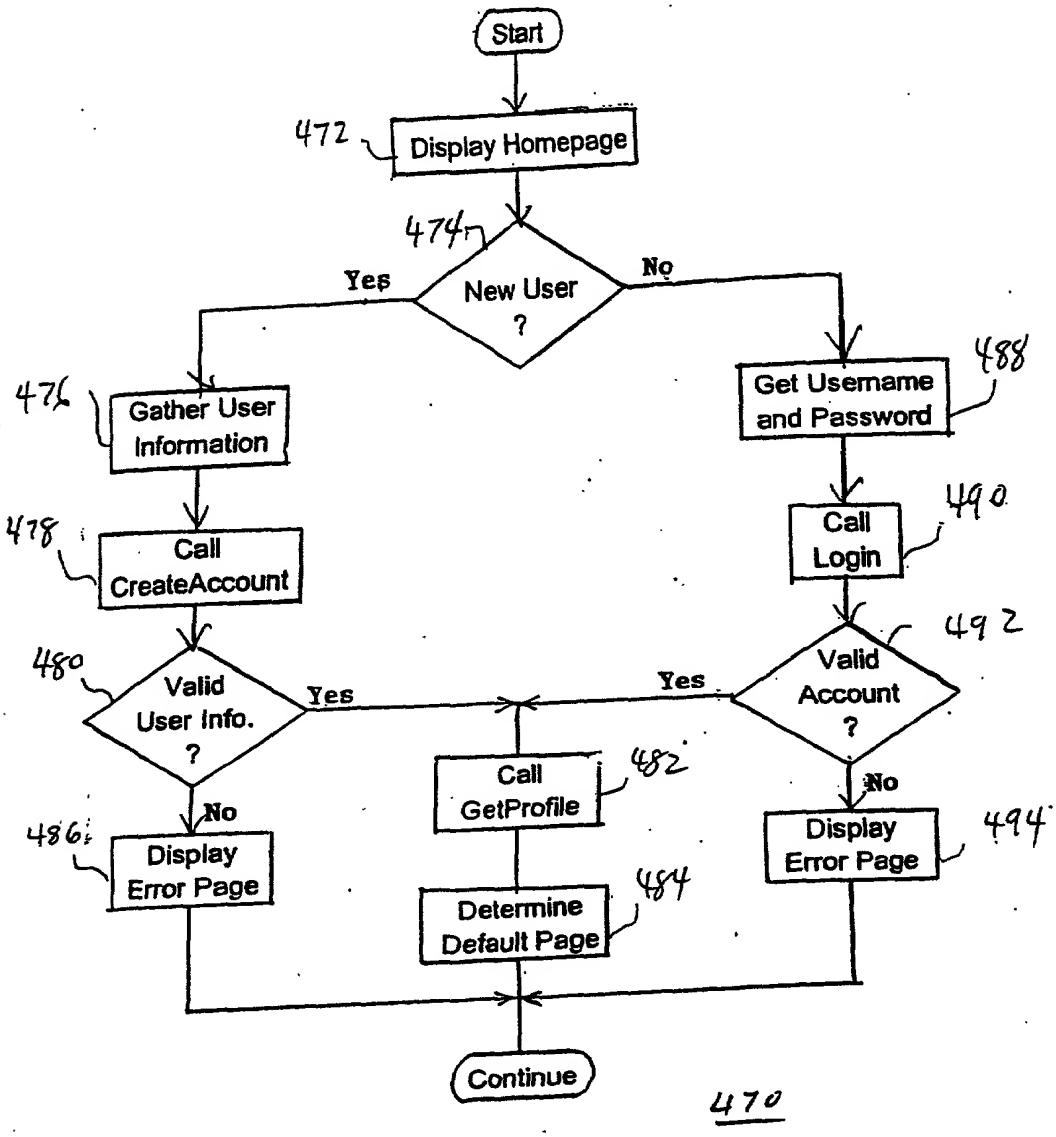
Start
472
Display Homepage
474
New User ?
Yes
No
476
Gather User Information
478
Call CreateAccount
480
Valid User Info. ?
Yes
No
486
Display Error Page
488
Get Username and Password
490
Call Login
492
Valid Account ?
Yes
No
494
Display Error Page
482
Call GetProfile
484
Determine Default Page
Continue
470

FIG. 26

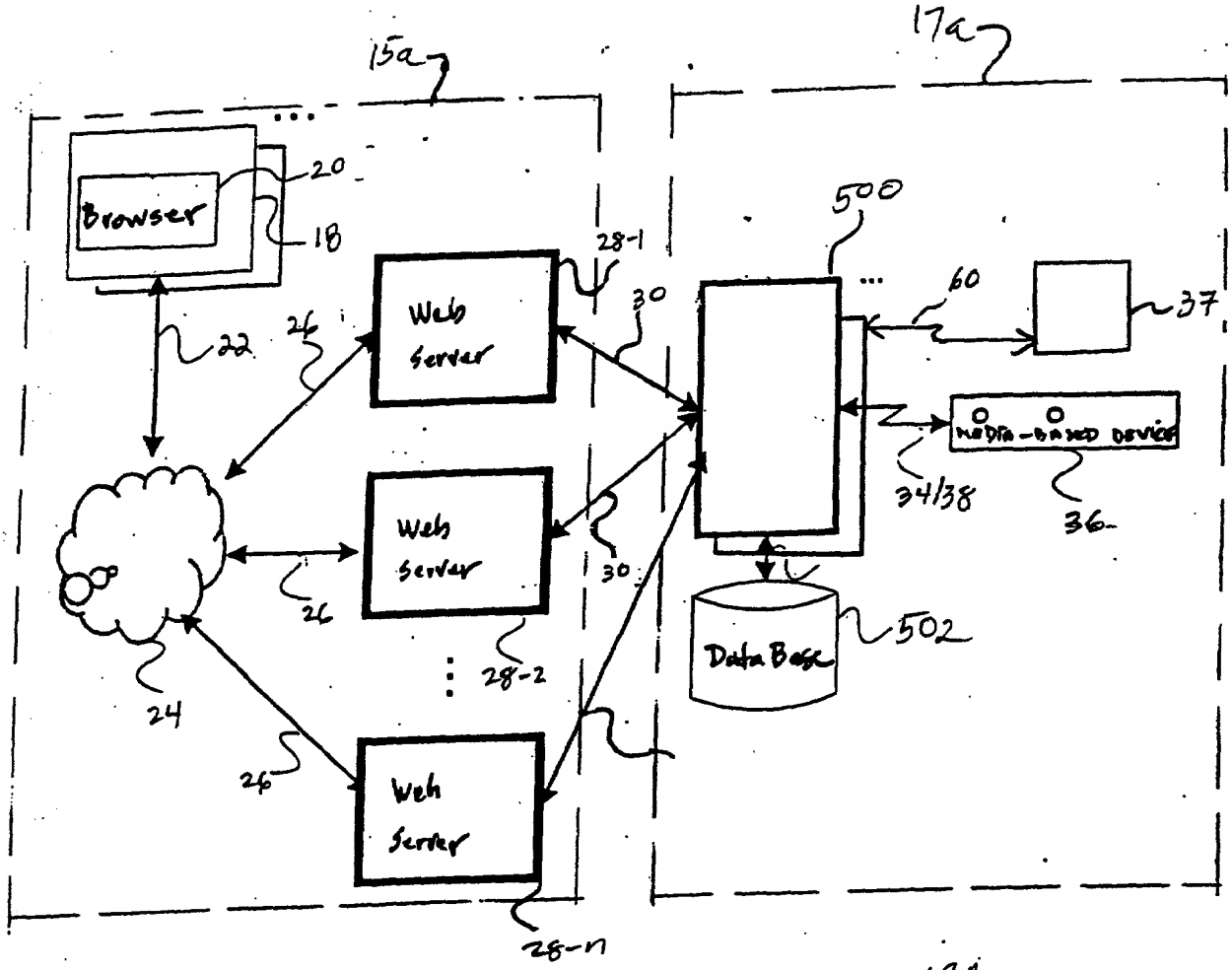
15a
17a
Browser
20
18
22
26
Web Server
28-1
30
500
60
37
MEDIA-BASED DEVICE
34/38
36
Web Server
30
26
28-2
24
Data Base
502
26
Web Server
28-n
19A

FIG. 27

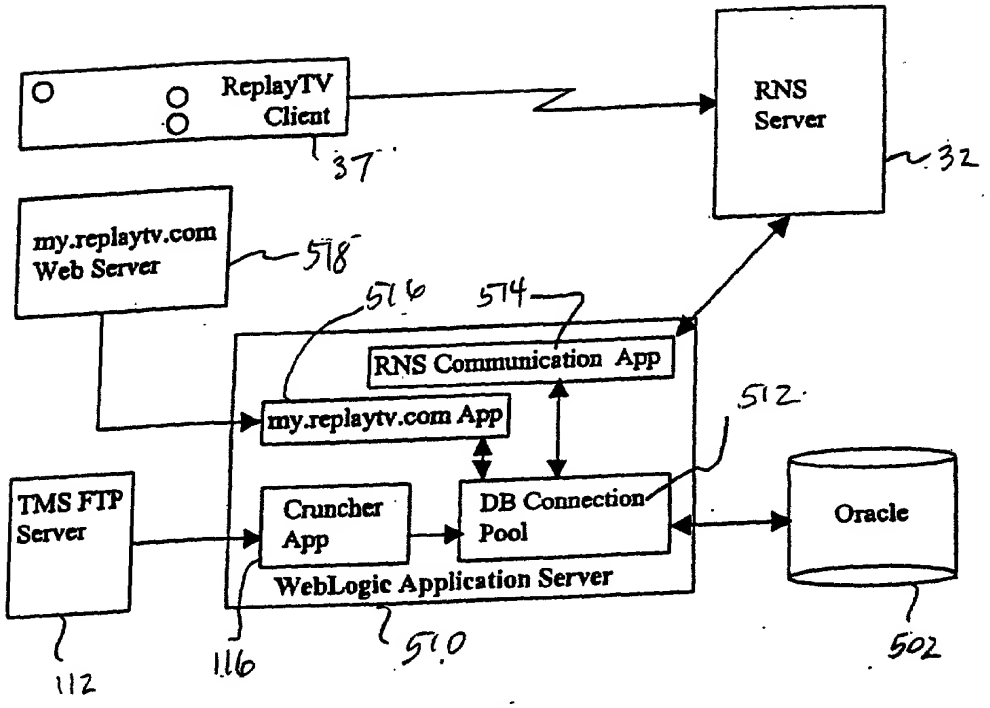

FIG. 28

05390-05390

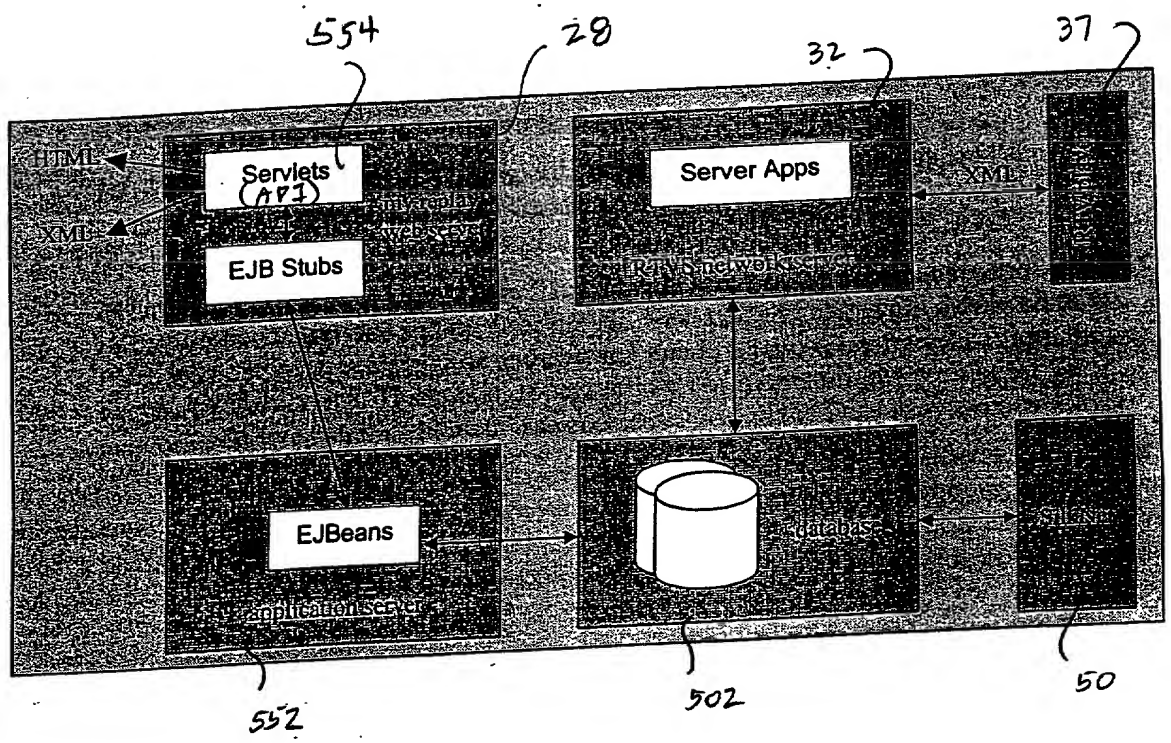
554
28
32
37
HTML
XML
Servlets (API)
EJB Stubs
Server Apps
XML
EJBeans
database
552
502
50
550

FIG. 29

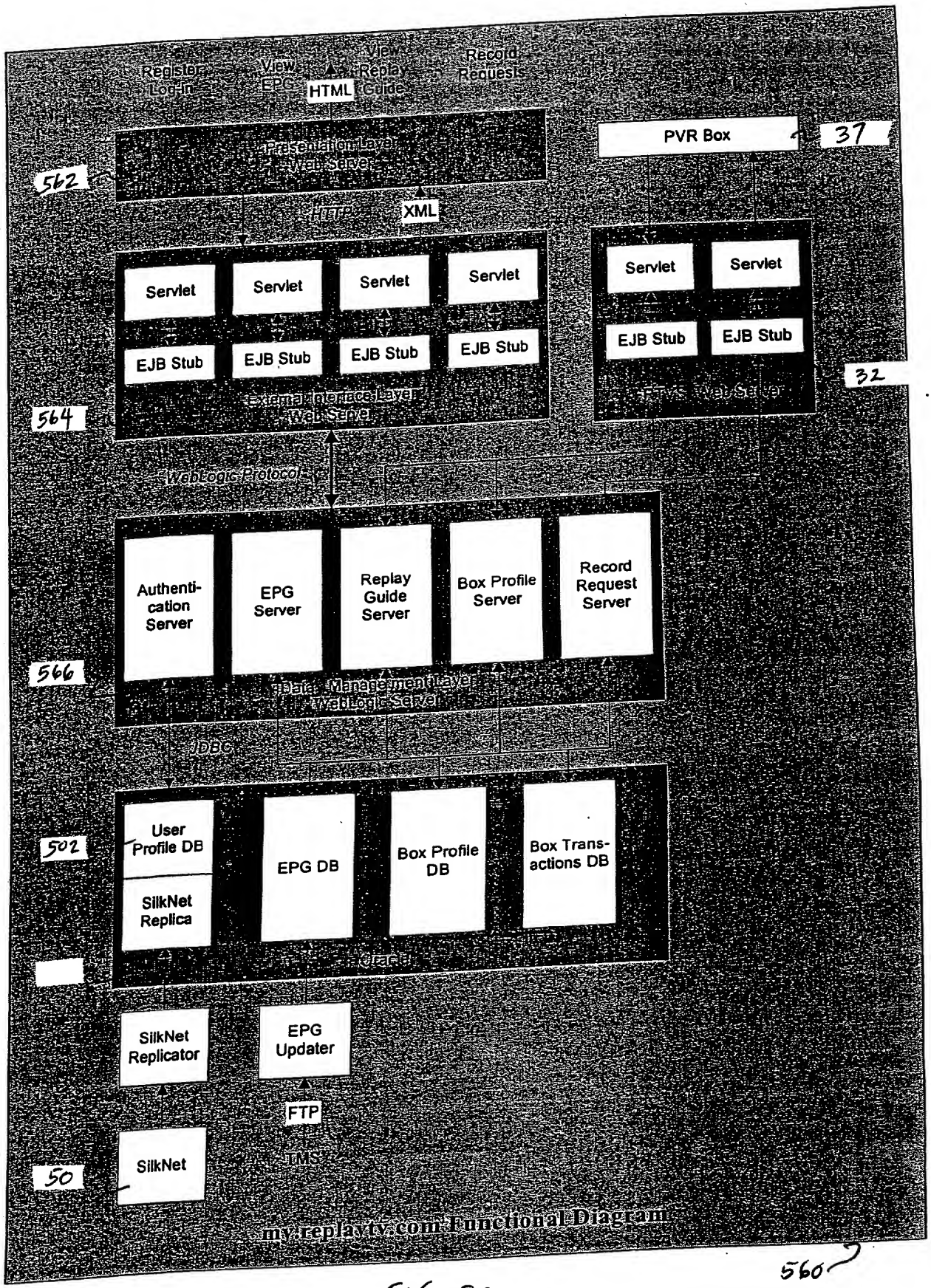
Register Log-In
View EPG
HTML
View Replay Guide
Record Requests
PVR Box
37
562
Presentation Layer Web Server
HTTP
XML
Servlet
Servlet
Servlet
Servlet
EJB Stub
EJB Stub
EJB Stub
EJB Stub
External Interface Layer Web Server
564
Servlet
Servlet
EJB Stub
EJB Stub
32
WebLogic Protocol
Authenti-cation Server
EPG Server
Replay Guide Server
Box Profile Server
Record Request Server
566
Data Management Layer WebLogic Server
JDBC
User Profile DB
SilkNet Replica
EPG DB
Box Profile DB
Box Trans-actions DB
502
Oracle
SilkNet Replicator
EPG Updater
FTP
SilkNet
50
LMS
my.replaytv.com Functional Diagram
560

FIG 30

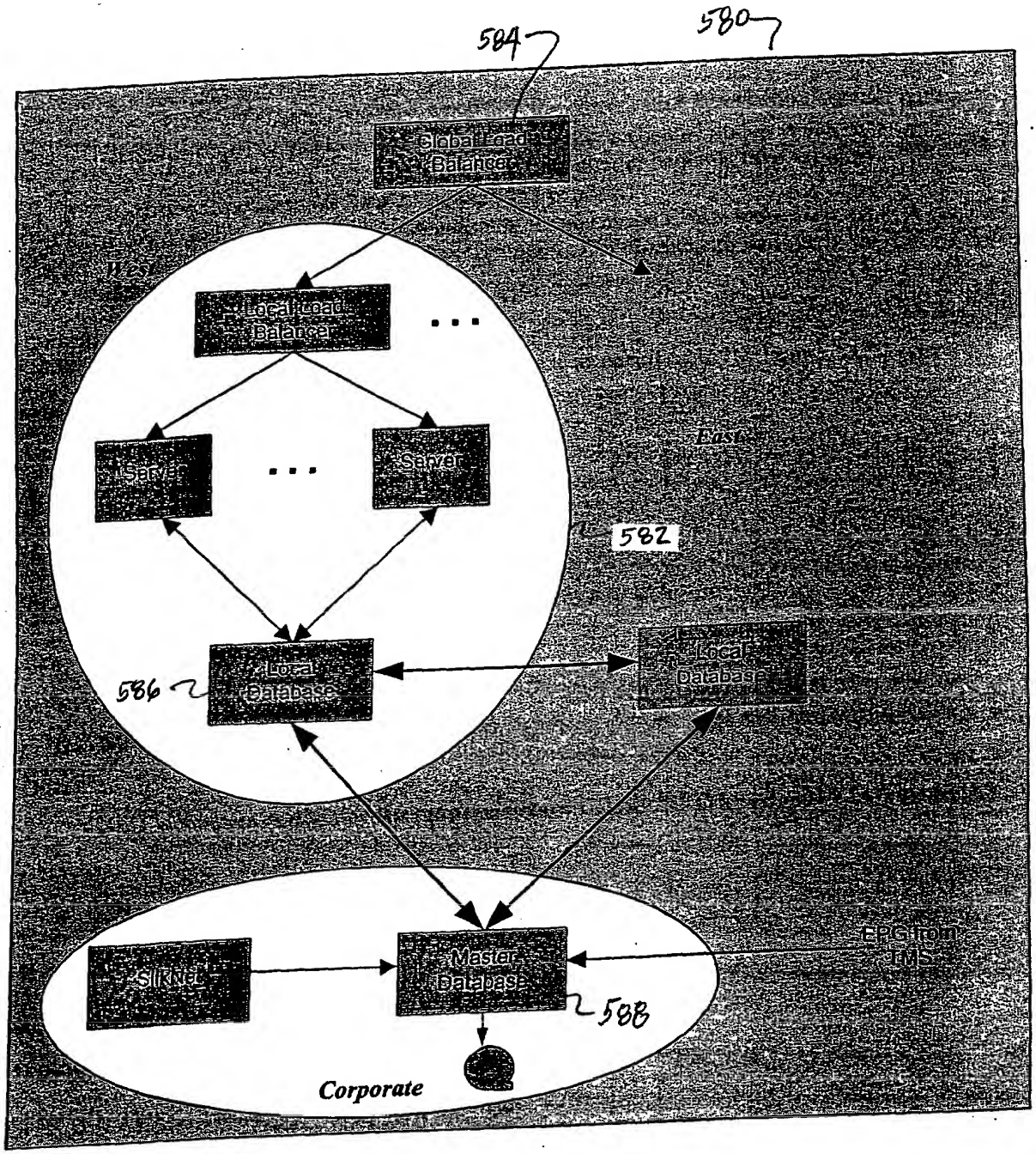

FIG. 31

EAST 22407-05390 US